NOVEMBER 1960

# DATA PROCESSING®

THE MAGAZINE OF AUTOMATIC OFFICE METHODS AND MANAGEMENT

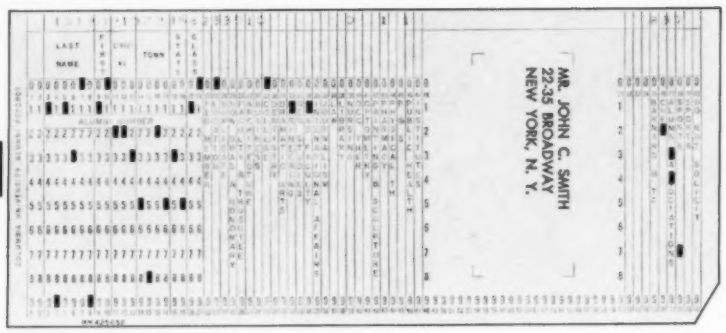
## ORGANIZATION AND PEOPLE

—page 17


- Computer Tapes and Their Care—page 11
- Electronic Data Processing—Translated—page 28
- Modern Controls—page 31

## SCRIPTOMATIC ADDRESSING SYSTEM:

**each customer's profile . . .**

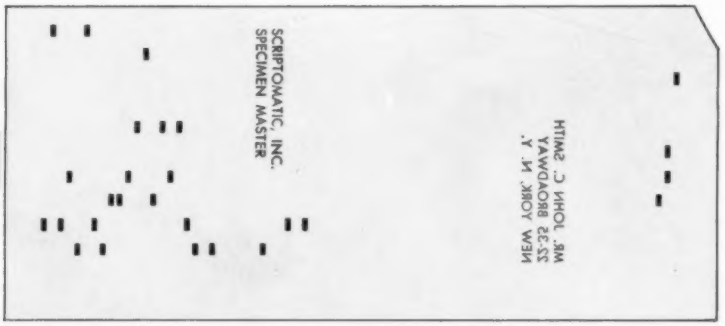



Any punched or plain card becomes a Scriptomatic Master

Front

Back

**an address card master . . .**

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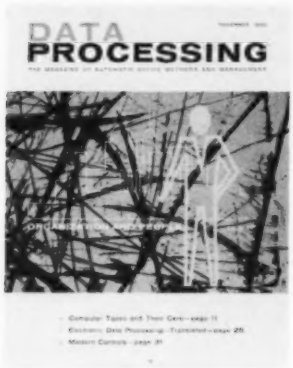
Volume Two • Number Ten

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**Published monthly by**
**GILLE ASSOCIATES, INC.**
**22nd Floor Book Tower**
**Detroit 26, Michigan**
**WOodward 2-8040**

**EDITORIAL AND CIRCULATION OFFICES**
22nd Floor Book Tower
Detroit 26, Michigan
WOodward 2-8040

**ADVERTISING OFFICES**
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333 N. Michigan Ave.
Chicago 1, Ill.
FRanklin 2-7100

**Subscription rate** $7.50 per year, United States and possessions and Canada; other countries $8.50 per year. Single copy 75c when available.

Send subscription correspondence and change of address to Gille Associates, Inc., 22nd Floor Book Tower, Detroit 26, Mich. Subscribers should notify publisher promptly of any change of address, giving old and new addresses, including city postal delivery zone. If possible, enclose address label from recent issue of magazine. Allow six weeks for change to become effective.

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Also publishers of The Punched Card DATA PROCESSING Annual (Applications Volumes and Reference Guide) and Data Processing Handbooks. Second class postage paid at Detroit, Michigan.

# OBSERVATIONS . . .

## from the publisher . . .

"LAY OFF the glamour-stuff and give us more 'basic punched card' information" is a note frequently sounded in our mail.

Mainly, this type of comment comes from data processing equipment users with the smaller punched card installations. Since this group represents a very large portion of the total number of data processing equipment users, we are most anxious to serve them as well as the larger users.

Many of these relatively small users have acquired their punched card equipment in just the past three or four years and therefore seek help in improving their basic systems. They do not see a computer or other electronic devices as playing a part in their operations in the near future.

Every issue of this magazine that has been published to date has contained some material that should be of interest to even the most "basic" user of punched card equipment.

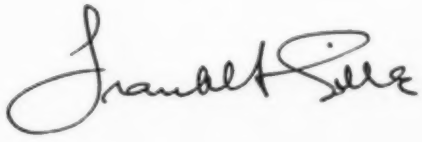
However, it is the natural function of a magazine to highlight the newest developments in a field, and the fact is that most of these developments have been centered on the electronic devices. And most of these devices have had their primary appeal to the larger processors of accounting or statistical data.

But this trend is changing rapidly. Each month we report new announcements of equipment that appeals to the smaller users. There is no doubt that the trend will continue and that small users who have kept abreast of these developments will be the first to enjoy the benefits. Many new users of punched card systems considered punched cards "too sophisticated" a few years ago.

Basic punched card applications have not greatly changed during the past decade, because the equipment itself has changed very little.

Punched card users will find a great depth of information available in the Applications Handbooks, which we have recently published. A separate Handbook is available for each of eight principal data processing functions or all eight may be obtained in one large binder called the Combined Applications Handbook. Separate Handbooks are also available for eight different industries, plus a Handbook of Wiring Tips.

The new users of punched card equipment have access to a wealth of ideas and information today that was not available to the earlier users.



# CONTENTS

NOVEMBER, 1960

## Cover Feature


▶ ORGANIZATION AND PEOPLE by John Caruso ..... 17

*Selection of leaders and their training in electronic data processing are discussed by computer manufacturer's representative.*


## Features


▶ COMPUTER TAPES AND THEIR CARE by George Cole ..... 11

*The disastrous Pentagon fire pinpointed data storage dangers. The author here explores the hazards to magnetic tapes and the possibilities for safest storage.*

▶ ELECTRONIC DATA PROCESSING — Translated by Douglas D. Hubbard ..... 28

*An explanation of some of the confusing computer terminology and a review of basic computer operations.*

▶ MODERN CONTROLS by Frank Embs ..... 31

*Almost any business can realize the benefits of integrated data processing by using service bureau help.*


## Application of the Month


▶ INVENTORY CONTROL FOR SHIPBUILDER ..... 23

*A bookkeeping machine is coupled to a card punch. Result? Withdrawals are posted daily by automatic means.*


## New Equipment


..... 34


## Monthly Features


▶ *Ray Marien on FORMS*
HOW NOT TO SELL BUSINESS FORMS ..... 25

▶ *Joseph R. DeParis on EQUIPMENT*
SYSTEMS AT LOWER COST ..... 42


## Departments


▶ BOOK SHELF ..... 48
▶ COMMENTS FROM READERS ..... 6
▶ DATA . . . YOURS FOR THE ASKING ..... 46
▶ EDITORIAL ..... 50
▶ NEWS SUMMARY ..... 22
▶ NOTABLE QUOTES ..... 45
▶ OBSERVATIONS ..... 3
▶ OUTPUTS ..... 44
▶ PEOPLE AND PLACES ..... 43
▶ PRODUCTS AND SERVICES ..... 39
▶ SEEN IN PRINT ..... 48


# AUTHORS

JOHN CARUSO *("Organization and People")* graduated from New York University with a B.S. in Marketing-Management. He started Brooklyn Law School but discontinued to join Remington Rand Univac. Experienced as programmer, training and systems analyst, and salesman, his work has varied from government accounts with Navy, Army and Air Force to advertising, merchandising, manufacturing, and banking accounts in relation to their respective computer areas. He is now Home Office Representative specializing in real time computer systems (airlines reservations systems). Mr. Caruso's background also includes military electronic courses at the European Command Signal School, Karlsruhe Electronics School, and the Guided Missiles Center.

GEORGE COLE *("Computer Tapes and Their Care")* started out to be an electrical engineer, switched to law and received his LLB from the University of North Carolina. The depression changed his plans from opening a law office to beginning an office equipment business. In 1945 he formed the Ramsey Company, of Philadelphia, which specializes in the sale of shelf type files and auxiliary equipment for the data processing department.

FRANK J. EMBS *("Modern Controls")* is president and general manager of the Champion Pneumatic Machinery Company of Princeton, Illinois. He has been with the company since 1923 when he began as accountant and worked up through the positions of comptroller, office manager, secretary-treasurer and director, vice president and now president. He is former director of the Princeton Chamber of Commerce, and is finance chairman of the Boy Scouts.

DOUGLAS D. HUBBARD *("Electronic Data Processing-Translated")* is an Administrative Staff member and Data Processing Supervisor for The Cowlitz County Public Utility District No. 1 of Longview, Washington. Mr. Hubbard was associated with The Long-Bell Lumber Company in Longview, Washington from 1947 to 1951 in research and machine accounting. In 1951 he directed the conversion from manual methods to punched card procedures at The Cowlitz County Public Utility and has been with the District since, except for a period in 1956 when on leave of absence, he supervised the conversion to punched card accounting for The Oregon Mutual Savings Bank in Portland, Oregon.

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For smooth-flowing, economical data processing, your punched cards must consistently meet the requirements imposed by your data processing machines. Any sacrifice in their quality can cause mistakes, lost time and higher costs—all of which destroy the efficiency of your data processing.

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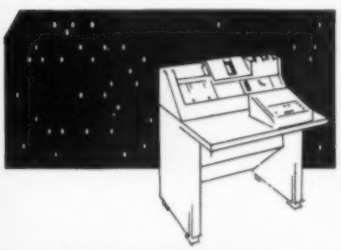
The IBM card is backed by unmatched DESIGN and SERVICE, too. Through IBM's many Card Design Centers... its Sample Card Center... its nationwide network of Card Plants and Warehouses... and through its Supplies Specialists and its Sales Representatives, who know *both* card and machine requirements ...the purchaser of IBM cards enjoys prompt, expert and complete assistance with any of his card needs.

This special backing makes the IBM card a *value* unsurpassed in the industry... and represents one more example of the way IBM helps you to enjoy Balanced Data Processing.



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We inspect our forms — and inspect them carefully — to make sure that the holes are accurately spaced and in perfect alignment. We take similar care with any file hole punching you may require.

We win friends with our wide selection of paper, too, and with our carbons, inks and construction techniques. Write us today for the name of the GC Forms representative nearest you.

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# Comments

### Ado about Indexes

*Indianapolis, Indiana*

Dear Sirs:

I am continually impressed by at least three things about your publications. First, of course, is the idea content. Certainly no other periodical in the field is so consistently packed with really stimulating material. A second factor which impresses me is the art work and general appearance of your magazine: straightforward but highly professional. Finally, grammatical and typographical errors always seem to stop me in my tracks while reading. . . . The high quality of the editing you people do is commendable.

May I make a suggestion? I, for one, never discard your magazine, but file it with other back issues for future reference. Somehow, I've always been too busy with other things to compile an index of the material in these issues. Would it be feasible for you to prepare an index, by subject, for your subscribers covering your first two years of publication; and then maintain it annually?

**Van B. Thompson**

*Ed. The December issue will hereafter carry the annual index. December 1960 will contain the two years to date index.*

*St. Louis, Mo.*

Dear Sirs:

Being a subscriber to several monthly business magazines, of which one is yours, who edit periodicals for people associated or directly responsible for machine accounting and data processing, I am writing to inform you of a simple idea in which to keep a reference list of all topics from past publications.

. . . I think it would be a good idea if you would print the name of the magazine and date on top of the content page. . . . The content page references will show in a few minutes if the desired topics are included in past issues, and if they are, what magazines and dates of issue.

**M. Kalish**
Manager, Tabulating Division
White-Rodgers Company

*Ed. Suggestion adopted with this issue.*

*(Advertisement)*

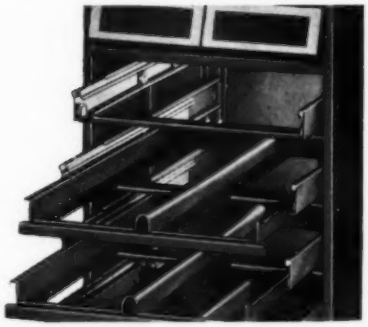
We Cerebrated and Decided to Tell You Our Card File Story...

# INSIDE OUT!

Almost everyone knows our card files are as beautiful as Miss America, rugged as the Rock of Gibraltar, and built like a fine watch.

However, we have noticed some people have wondered *why* this is true.

So, we decided to tell you the "inside out" story of this remarkable file, which in a short time has attained a top position in a most competitive field.



So, let us start with the inside of a Tab full suspension file, and work our way out, checking over advantage by unparalleled advantage.

### SUSPENSION

Take a look at the suspension pictured above. There is more here than meets the eye. First of all, there is the suspension arm. How many bearings can you count? This arm is a key to the jewel-like precision action of the file!

### INTERCHANGEABILITY

But it is not the only key! Take a look now at the track. This track is the key to the almost unbelievably efficient interchangeability of Tab Card File system. You can interchange tracks in a couple of minutes with only the help of a screwdriver; thereby converting a ¾ suspension file drawer assembly to a full suspension or vice versa.

Here is just one hypothetical example of what this could mean to you: To get optimum efficiency at minimum cost, you can buy nine ¾ suspension files and one full suspension file. With a few minutes work transferring full suspension carriers to the top level in each file, you can have a battery of files like that

pictured in the illustration where the active cards are on the top level of your ten files at the most convenient height—*and have full suspension.*

Look at the drawing, where top drawers, with active cards, have been indicated in gray. You see at a glance how Tab Products suspension and drawer interchangeability allows you to develop greatest efficiency at lowest cost.

### TRUE 6-POST CONSTRUCTION

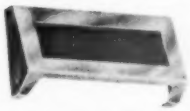
The reason for this, and its value to you, is that it assures case rigidity. In turn, this rigidity means that your Tab Products File will continue year after year to provide perfect service with smooth precision drawer movement.

### THEY ALWAYS LOOK NEW!

Now, let's take a look at the drawer. Note that there is a *real* handle in front and a real handle in back. The beautiful drawer front is virtually indestructible! It is not only beautiful, practical, and durable—but easily replaced at negligible cost. Think about this!

This means that your installation of Tab Card Files can always look brand new. Forever new! Who else can give you this remarkable guarantee?

### CAST ALUMINUM DRAWER HANDLE



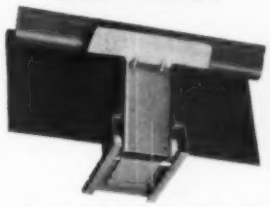
A triumph of sophisticated modern design! To see them in batteries (full suspension indistinguishable from ¾ suspension) is to grasp the visual appeal of modern business at its best!

### FULL WIDTH INDEX HOLDER

This accepts a complete tab card on which you can write the index so large you can read it clear across the room. Even more important, when you are close to the file, you can look down at the index on the bottom drawer and *read* it. If any one else provides this feature, we would like to hear from them.

While we are talking about the drawer, notice the smooth sides: This means you can put the cards in and take them out with rapidity and ease. The channel structure of the bottom is equally important, giving the tray rigidity. The tray is so cleverly designed that with all these advantages, it is still among the lightest available.

### FOLLOW-BLOCK

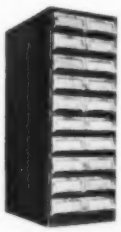


See the full width hand grip! Note the gnurled wheels. This follow-block stops *anywhere*—completely freed from the awkward intervals of ratchet tracks.

### DRAWERS STACK

These trays *really* stack. They stay on trucks going around corners.

### CONCLUSION



Tab Products Card Files, with completely interchangeable drawers, are available in 24 models. These provide an integrated card filing system at a reasonable price with 20 drawer, 14 drawer, and 10 drawer units, all optional with either full or ¾ suspension, cast aluminum (shown in this advertisement) or standard drawer fronts.

This remarkable file, like a certain motor car manufactured in England, has, as you can now see, a long list of exclusive features. But, like the car, the most valid impact it makes is its sparkling impression of *general excellence.*

Your local Tab representative will enthusiastically give you full information; or write to Tab Products Co., 995 Market Street, San Francisco 3, California, for File Brochure, Catalog 10, or Data Processing Department Planning Kit.

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PRODUCTS CO.

Circle No. 4 on Reader Service Card.

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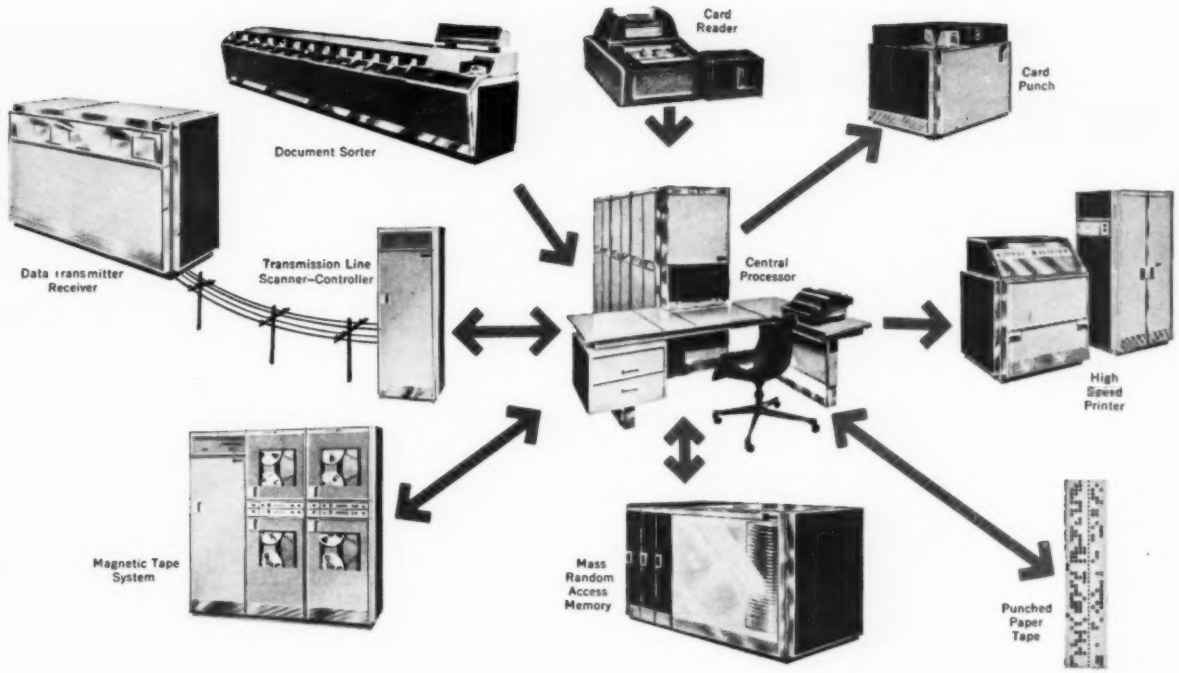


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performs a multitude of jobs at much lower cost.

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allows low cost input-output additions and substitutions.

permits many varying and money-saving applications within one organization—including minimum cost conversion.

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James D. Short, Supervisor of Tabulating, American President Lines

# "We did away with 300,000 postings!"

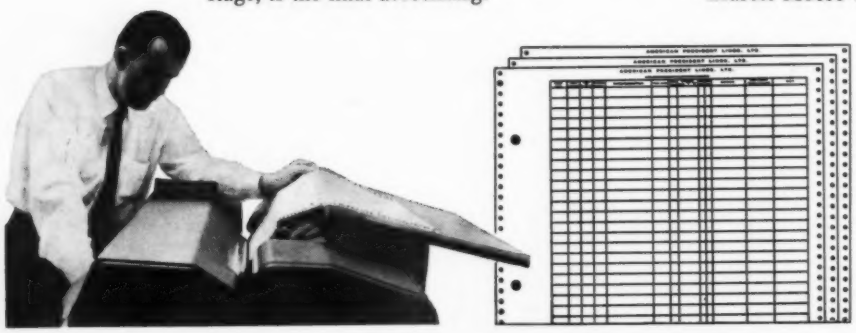
**THE SETTING:** American President Lines operates 30 cargoliners and 5 passenger liners. To make up voyage revenue and budget reports, the company collects and sifts mountains of data from scattered ports all over the world.

Reservations from 18 offices, 30 principal agents and thousands of travel agencies funnel into San Francisco headquarters every 24 hours. Facts in foreign weights, measures and currencies are converted to U. S. equivalents, summarized, and printed. The system also produces many other important reports.

**THE SYSTEM:** Data received is put on punched cards. An electronic accounting machine processes the cards, converting to U. S. standards, and prints the information on a daily summary sheet, an interim revenue report. This is revised daily as new figures come in and, in its final stage, is the final accounting.

After a ship has sailed, more incoming data is carded and radioed to sea. After a 120-day cruise, a budget report is run off, summarizing the vessel's performance—estimated vs. actual. A final budget report compiled in 10 days, as against 8 man-months, is the basis of management decisions on cargo matters, revenue volume, receipts and expenses, equipment needs, etc. The system speed-up resulted largely from eliminating 300,000 tedious manual postings a year—a crucial operating gain. The Moore forms in the system are the Line's control in print.

**THE COUNSELORS:** "We appreciate the system control and the help in forms design which the Moore man gave us," says James D. Short, Supervisor of Tabulating. For more details on how Moore may be able to help with *your* problems—no matter what kind or size of business—write the nearest Moore office. No obligation, of course.



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# MOORE BUSINESS FORMS

Circle No. 6 on Reader Service Card.

By George Cole

# Computer Tapes and Their Care

**Some precautions against fire, humidity, demagnetization, dust, and shock, to preserve magnetic tapes in safety.**

HIGH SPEED COMPUTERS using magnetic tape on reels are daily becoming more vital to American business and industry.

The devastating fire that occurred in the Pentagon several months ago has caused much conversation on the subject of how to be sure of preserving the information stored on these reels of tape.

Magnetic tape in use today is made of three substances, namely, steel, acetate or Mylar. Mylar is the most frequently used. The information, or data, is put on the tape by means of a magnetic impulse that re-aligns the surface molecules creating, in effect, coded letters and numbers. It is simply a magnetic state and does not change the tape surface physically. The information may be erased or rendered useless in one of five manners:

1. Extremes of heat or cold
2. Excessive relative humidity
3. De-magnetization
4. Dust
5. Shock—with reservations

In view of the Pentagon fire the greatest fear of loss is the likelihood of excessive heat.

Just how much heat will tape stand?

According to our most reliable source of information, to assure correct operation of acetate tape the temperature should be between 65 and 80 degrees Fahrenheit. The allowable range for Mylar is somewhat greater, being between 50 and 90 degrees Fahrenheit. The range for steel tape is about the same.

Mylar tapes used infrequently may be stored for long periods of time at temperatures of 40 to 120 degrees Fahrenheit. Before processing, however, they should be conditioned for at least 24 hours within the 50 to 90 degree range.

It has been said authoritatively that Mylar tape will actually withstand temperatures up to 350 degrees Fahrenheit—that after conditioning it is possible to recover the information but with some difficulty. Beyond that point the Mylar backing will be destroyed.

Acetate tape can be temporarily stored up to four hours outside the range of recommended conditions without hermetic sealing providing the temperature does not exceed 120 degrees. Temperatures above 120 degrees will cause tape to curl, warp or shrink and, as a result, permanently damage the tape and make the records practically unretrievable. Tape records will be completely destroyed at temperatures of 250 degrees. The tape itself will start to melt at temperatures above 250, actually melt at 300, and support combustion at 400 degrees Fahrenheit.

Most of the reels upon which tapes are wound are made of a plastic called Polystyrene—although some are made of steel. Almost without exception, the round plastic containers for housing reels of tape are made of Polystyrene. Toxic fumes emanate from burning tapes and Polystyrene cases. Without adequate masks it is virtually impossible to get close enough to a fire to fight it. The melting point of Polystyrene is considerably below 350 degrees Fahrenheit so that there is a very strong likelihood that when this temperature is reached the container and reel will fuse so that it would be almost impossible to recover the tape for processing.

### Steel not heatproof

The question is often raised as to whether the steel cabinets in popular usage today provide protection for reels, tapes and their containers. This writer's answer is—NO.

Confusion seems to exist when it comes to the definition of fire resistive equipment. The mere

fact that a cabinet for housing reels of tape is made of steel and has an enclosed front—be it a door or drawer front—is no assurance of its protecting against loss by fire, except possibly small fires in a waste paper basket.

For all practical purposes—up to a certain point—a cabinet made of wood offers greater protection than one constructed entirely of sheet steel.

Although wood burns at a temperature far below the melting point of steel, it is nevertheless a non-conductor of heat, whereas steel is a very good conductor. You may test this by putting a ½" or ¾" slab of wood over one burner of your kitchen stove and an iron or steel skillet over another. Turn the flame to about the same height and break an egg in the skillet—also break one on the slab of wood. By the time the flame has gnawed through the wood to the point of cooking the egg the one in the skillet shall have been burned to a crisp.

The reason is that a certain amount of moisture is held in suspension in the wood. When heated, the moisture turns to steam, which acts as a buffer against penetration of heat until the wood is actually consumed.

The greatest objection to wood cabinets versus steel is the cost of manufacture. Sheering steel, forming it on modern presses, welding, applying the finish and baking the enamel in an automatic oven is far less expensive than the careful selection of wood, aging it over a period of time in the kilns at correct ranges of temperature and relative humidity, cutting, assembling and finishing with at least two or three coats and possibly rubbing to a high finish.

To be sure—wood provides *no* protection for a prolonged period of time.

The only office equipment available today that offers any semblance of protection to tape is in the form of insulated vault doors or safes tested by the Underwriters Laboratories or the Safe Manufacturers National Association.

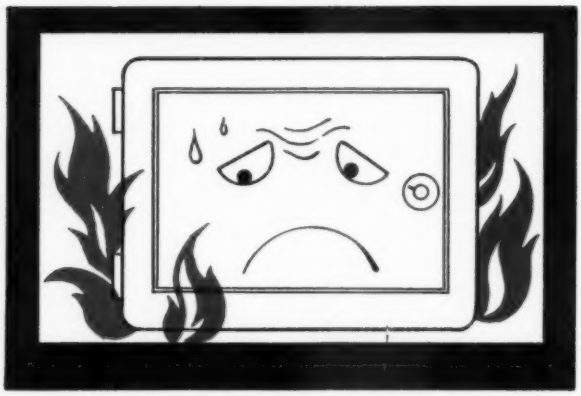
#### Testing fire safe equipment

You will undoubtedly be interested in knowing of the tests to which safes are subjected by the Underwriters Laboratories to qualify for the "A" label.

A specimen safe containing papers, records, etc., placed in a specially constructed testing furnace, must withstand four-hour exposure to heat reaching 2,000 degrees Fahrenheit. To give you an idea of what 2,000 degrees means, various metals melt at temperatures as follows:

| | |
|---|---|
| Aluminum | 1,220° F. |
| Phosphor bronze | 2,102° F. |
| Coinage gold | 1,724° F. |
| Stainless steel | 2,642° F. |

During this four-hour test the temperature within the safe cannot exceed 350 degrees Fahrenheit.



Another test takes place at the conclusion of the four-hour period. The fire is extinguished, and with the furnace still closed, the safe is allowed to absorb the intense heat of the refractory lining of the furnace until the entire mass eventually cools. The inside temperature of the safe is observed and recorded throughout the test by use of temperature-measuring devices. During this period the temperature inside the safe cannot exceed 350 degrees. When the safe is opened, after cooling to normal temperature, the contents must not be charred, and must be entirely legible. This additional test—in which a safe may fail, due to improper quality or quantity of insulation, or to structural weakness—simulates a safe lying in the intense heat of the debris of a fire.

Another safe is subjected to sudden and intense heat for 30 minutes in a furnace preheated to 2,000 degrees Fahrenheit. If dangerous gases accumulate from the insulation during this period, they will explode, destroying the safe and its contents. If no explosion occurs, the furnace temperature is reduced to 1,500 degrees Fahrenheit. The safe remains in the furnace for an additional 30 minutes, during which time the furnace temperature is gradually increased to 1,700 degrees Fahrenheit. At the end of this one hour period, the safe is removed, and while red hot, is dropped 30 feet on a bed of broken rock, etc. Two minutes elapse between the time the fire is extinguished and the safe is dropped. The safe is placed back in the furnace, regardless of its condition, bottom side up, and reheated for one hour at temperature reaching 1,700 degrees Fahrenheit. The fire is then cut off, and the safe allowed to cool to normal temperature in the closed furnace, after which it is removed, opened and inspected. To pass the test, all papers inside the safe must not be charred and must be entirely legible.

#### Storage in safe

One manufacturer claims that the interior of its "A" label safe, when subjected to Underwriters Laboratories test, has never risen higher than 212 degrees Fahrenheit. This is said to be because of a

thermostatically controlled, insulated valve door that automatically seals the interior against excessive heat penetration during the fire exposure.

It is most important that, in the event of a fire the safe be allowed to cool to room, or atmospheric, temperature before opening it. When opened before being completely cooled an explosion may result, destroying the records or reels of tape that have actually survived the ordeal by fire.

One of the best safes available today measures 60¼" high x 40½" wide x 27" deep inside. This safe will house approximately 180 reels of tape. This pre-supposes their being stored in racks for convenient access. When loaded you have a weight of about 4000 pounds in an area approximately 43" wide x 32" deep.

This results in the need of another word of caution regarding the load carrying capacity of your elevated floor. One manufacturer advertises his flooring to be capable of carrying a 1000 pound caster load at any point with a deflection of not more than 1/300 of the span at that point. Be sure your floor is sturdy enough to carry such a load if you contemplate the use of a safe like the one described above.

This same safe including reel racks and delivery sells for approximately $2,000.00. Based upon 180 reels, the cost per reel housed is about $11.00.

Four classes of safes, or fire resistive cabinets, are available for the protection of records or documents. They are rated by the Safe Manufacturers National Association and the Underwriters Laboratories as capable of withstanding certain temperatures for ½ hour, 1, 2 and 4 hours.

According to data compiled by the National Fire Protection Association for the Safe Manufacturers National Association, 94.6% of vital paper records housed in four-hour Class-A safes came through undamaged, whereas only 34.7% survived when housed in insulated cabinets bearing the ½ hour label.

It has been specifically pointed out, however, that equipment failure must be expected if equipment which is insufficient for existing conditions is used, or when equipment suitable for a given location is moved to another location having a higher maximum fire protection requirement.

This is simply intended as a word of caution. Unless you are certain of your fire hazard, do not content yourself with entrusting your records to an insulated container unless you acquire the best or unless you have an analysis made to determine the intensity of the heat that might develop.

#### Vault storage

Should you contemplate storing your tape in a vault — now in existence or to be constructed — remember the construction requirements vary with the construction of the building itself. This depends upon whether the building is classified as fire-resistive or non-fire-resistive.

A ground supported vault is required to assure safety in the event of a non-fire-resistive building. As the name implies, it is structurally independent of the building in which it is located.

A structure-supported vault is one which is supported by the frame work of a fire-resistive building, and may be supported individually on any floor of such building.

To all intents and purposes, a vault door is constructed the same as a safe door.

Although you may be using the best safe or the best possible vault for the protection of your tape you cannot be certain that you are immunized against loss by fire. Statistics show that the predominance of business fires occur during business hours. This is the time your tapes are on the computer or lying around the room ready for processing or other handling. Can you be sure that your employees will see to it that they are tucked away in safe-keeping before running to save their own lives?

Before fire can occur there must be heat, fuel and oxygen.

In the case of the Pentagon fire — there was a temporary light bulb against an acoustic ceiling tile over the tape library creating enough heat to ignite the tile and the wood over the ceiling. Oxygen was present in the room and additional oxygen was supplied through the air conditioning ducts. It was estimated that temperatures in portions of the machine room ran as high as 2500 degrees Fahrenheit.

#### Precautionary measures

This points up several areas where precautionary measures should be taken:

1. Be sure the ceiling—and structural members

*(continued on next page)*

if possible — are of non-flammable or non-combustible material.

2. Be sure electrical wires are sufficiently heavy to carry the load and that the insulation has not deteriorated with age or dried out from heat.
3. Be sure that fuses or circuit breakers are of low enough amperage to break the circuit in the event of a fault (short circuit) or overload.
4. Be sure the air conditioning system is equipped with fire dampers. This is accomplished by attaching a fuseable thermal link to the damper. When the temperature reaches a pre-determined temperature the link melts and closes the damper.
5. Good housekeeping may play an important part, too, in depriving a fire of a place to start because of no fuel.

**Fire hazards**

A fire may break out unexpectedly and through no fault of yours. For example, during World War II many fires on board ship spread from one compartment to another when no passageway was open. A fire in one compartment was oftentimes hot enough to ignite the several layers of paint on the opposite side of the bulkhead.

At least one large company with an ex-Navy man as an engineer in its computer section is contemplating the installation of a waterfall sprinkler system so that in the event of fire in an adjoining room, cooling water will flow down the fire wall inside the computer room. Plans also call for a trough between the main floor and the elevated floor for removal of water after it has performed its cooling operation.

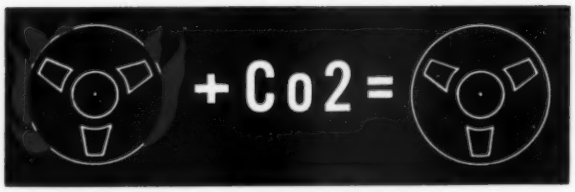
Given the unfortunate experience of a fire in your computer area, how may it best be extinguished?

The widespread use of a conventional sprinkler system seems to be frowned upon by many companies because a fire of absolutely no consequence can and oftentimes does set the sprinkler system into operation causing not only a messy situation but great damage to the entire computer system—particularly the electrical portion.

One company, however, favors the use of a sprinkler system controlled by a valve outside the machine room rather than run the risk of its being set off accidentally by a slight excess of heat when actually there is no fire.

In actual tests, carbon dioxide (Co2) applied to burning Polystyrene reel cases has smothered the flame. However, as soon as the Co2 cloud was turned off and oxygen could get to the cases, they re-ignited.

Dry powder such as baking soda seems to be




effective, although difficult to apply to all areas affected.

So-called *wet* water is a liquid formed when a special chemical substance is added to regular water and breaks down its consistency and gives it a penetrating power of 10 to 1 compared to regular water. This is fine for use when it comes to extinguishing a fire in high density material such as bales of cotton, lumber and waste paper, but it will not penetrate a plastic case. So ordinary water should do an equally effective job.

The most effective means, therefore, seems to be the use of a fine spray of regular water under high pressure applied directly to the areas in question.

There are available from one source plastic cases made of material that is self extinguishing. There is an objection to these, however, due to the fact that the plastic is cloudy and it is impossible to read or identify information on the side of reels housed therein. The same situation prevails when reel cases are made of aluminum.

**Humidity dangers**

Humidity is perhaps the second greatest cause for concern in computer operation.

It appears that acetate tape performs quite satisfactorily where the range of relative humidity is between 40 and 60%. Mylar—as in the case of temperature—has a greater allowable range of 20 to 80% relative humidity. Steel is said to be in about the same range as acetate.

When processed infrequently, the relative humidity may be allowed a range of 0% to 80%—with a 24 hour conditioning to bring the tape within the aforementioned limitations.

Fungus growth tends to appear on acetate or Mylar tape when exposed to greater than 80% relative humidity for more than four hours. Although the tapes may generally be cleaned, it is a rather slow and bothersome process.

To the best of our knowledge and belief, no tape —encased in plastic containers—has been enclosed in and subjected to the rigors of testing safes in accordance with the specifications of the Underwriters Laboratories or the Safe Manufacturers National Association. One of the secrets in keeping papers from charring and the interior temperatures from exceeding 350 degrees Fahrenheit is that the insulation has the ability to hold moisture in suspension. When heat is applied, the contents are immersed in a bath of steam. It will be

interesting to know what actually happens to the plastic containers, and, in turn, the tapes and the data stored thereon.

**De-magnetization and dust**

De-magnetization happens very infrequently within the computer area itself. Where the modus operandi requires that tapes containing data must be shipped via common carrier, it can happen. If you have the problem of shipping via plane, train or truck, you have no assurance your tapes will not be adjacent to machines or instruments containing magnets. Lined shipping cases are available to protect you from loss in this manner.

Dust is the fourth most prevalent cause of removing material housed on tape. At least two manufacturers of round cases apply rubber gaskets to that area where the two portions of the case came together. This tends to prevent penetration of dust and at the same time is presumed to offer some protection against excessive relative humidity.

In the early stages of computer development it was presumed that excessive shock would remove the magnetic state. Shock is now believed to have little bearing. However, the Polystyrene reels and cases are rather fragile, hence shock should be avoided or at least reduced to a minimum.

Assuming the foregoing to be true, it is evident that the preservation and storage of data on magnetic tape presents a somewhat different problem from the storage of the source documents or business papers.

Here are some of the reasons:

**1.** Fire resistive safes and vaults were designed primarily for the protection of business papers. The protection provided for magnetic tape is still an unknown quantity.

**2.** When vital information was kept solely on paper, an extra copy or two could be made and removed to a remote area—in some cases to underground vaults. As more records were created they, too, could be sent to the remote area. These records traveled in one direction only. Computer tapes must be provided with computer tickets because they must be constantly and continually brought back to the computer center for correction and updating.

**3.** If the paper documents contain all of the information necessary to the continued satisfactory operation of an organization, there would seem to be little need for a computer.

**4.** If the paper documents do not contain information that is valuable only after re-processing them—why keep them at all? They occupy far greater space.

**What can be done?**

How then can you be sure?

An engineer from one large company feels it essential to have five sets of master file reels of tape for each job. He likens it to a family consisting of son, father, grandfather and great-grandfather, plus one more set for far remote, off-premise, storage. The son represents today's *(Thursday's)* activity and is the current output file on the machine at the moment. The father represents the previous day *(Wednesday)* and along with today's change file is used to make the son today. The son is then stored in the library—preferably isolated from the main computer room by a fire wall—and the father plus today's change tapes are taken to the remote, on-premise, vault, Grandfather represents the second previous day *(Tuesday)* and is in this remote, on-premises, vault with great-grandfather *(Monday)*. The great-grandfather is then brought back to the library to become activated for the next day's run. The fifth set of reels with changes is to be brought back periodically from the remote storage area for updating.

Air conditioning, humidity control and air cleaning equipment, elevated floor, non-combustible acoustical ceilings and *No Smoking* signs make the computer room the most expensive office work shop area it is necessary to create in today's business world.

*(continued on next page)*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It is little wonder then that with all of the expense involved in planning, installing, programming and creating the computer room that top management wants to make it a show place.

Efficiency with speed, however, is the order of the day. To avoid needless travel time and because of the high cost of creating space, it is desirable to consider very carefully how the reels of computer tape are to be housed.

Scratch and test tapes, procedures manuals, write-ups and machine run binders are more often than not kept within the main computer room.

Available from one source are two and three shelf cabinets, with or without doors *(locking if required)*. They may be stacked, one on the other to create five shelf cabinets or two two-shelf units combined creating a 4-shelf one.

Each shelf will accommodate racks capable of housing 15 to 25 reels of tape—depending upon the computer in use.

These same cabinets will accommodate any ring binder ordinarily used as a procedures manual, run-off sheets 11" x 14⅞" in binders. Small pamphlets, loose papers or the ordinary type file folder may be housed in hanging type folders suspended from horizontal rails located immediately below the recessed type doors. These contribute much to appearance and ease of filing and finding.

**Skeleton cabinets**

For library storage or storage in remote areas, skeleton type cabinets are available. The reel racks used in these are the same as in the two and three shelf cabinets mentioned above. They are plated to make the finish virtually indestructible.

Where it is not necessary to keep your reels under lock and key the skeleton units offer three advantages:

1. Economy of acquisition
2. There is virtually no surface that can collect dust. Even with air filters and air conditioning, dust will eventually accumulate.
3. Free circulation of air—hence better conditioning of reels is assured.

Provision is also made for grouping either of the aforementioned types of cabinets to conserve space. By way of example—nine units 36" in width would occupy 27 running feet of wall space. By the grouping arrangement, 5 cabinets could be located against the wall. The remaining four would be located 2" in front of the 5 and suspended from overhead rails. This reduces the wall space requirement to fifteen feet.

With a pressure of between four and five pounds, the ones in the front row may be shifted side to side for access to the ones in the back row. ■


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COVER FEATURE

# Organization and People

**Electronic data processing needs best utilization of leaders.**

WHEN IT BECOMES EVIDENT that a computer installation has become a primary source of savings for the company, rather than merely an acceptable innovation for data processing, then it is time for the organization to evaluate what it possesses in personnel calibre.

### Analysts

A careful screening should be made at this point to determine what people are best suited to this radically new undertaking, in the areas considered for computer applications. It is important that those already employed in these areas be investigated first in the interest of more efficient procedural analysis and systems design. The background that these people have with the standard operating procedures peculiar to that organization will provide progress without indecision and confusion. These, after all, are the people who daily overcome the problems linked with data processing. Because of the supervisory nature of their roles in the organization structure, they are able to cross departmental lines, providing them with a broad view of the relationships between areas.

**By John Caruso**

This is the calibre of personnel desired to instrumentate a new system. Revising the procedural makeup of an old but time tested and dependable system is a delicate assignment. The people selected for this task should have a knowledge of the ramifications and possible repercussions involved.

Another significant reason for attempting to staff the data processing section with experienced employees is that a person not directly involved in the area under consideration requires training, whether he is a present employee or a new hire. However adaptable a new employee may be, the progress in system analysis will not be as immediately effective by comparison with an experienced employee. New hires or present employees of unrelated sections should not be ruled out as possible sources of talent, however. Many organizations using computers have been extremely successful with these people in the long term.

With the selection of the systems analysis staff the company must provide the tools so that each man can perform his job. The analyst should have a working knowledge of the computers. All manufacturers provide adequate courses. It is essential

that the analyst participate in such courses so that he obtain all available data pertinent to system design with regard to his associated computer. Such data will thereafter form the basis upon which decisions are made. Knowledge of the capacity and speed of tape, cards, and central computer; the daily, weekly, annual, and other period requirements of the proposed system; how to reconcile these requirements with the computer system proposed; how to calculate processing speeds in order to evaluate workloads; when it is advantageous to process on cards as opposed to tape and vice versa —these are but a few generalities of the investigative areas concerning the analyst.

**Flow charting**

The systems analyst may begin his investigation by recording in flow chart form all the stages of present documents. This includes the initial entry into the system, an invoice for example; the documents created by and for each section in keeping records for the transaction; and finally the output, such as a check. After clearly defining all the necessary operations in the paper flow of the system, the analyst will attempt to re-create the system to make it adaptable for the computer. In so doing he will use a series of unique symbols to depict the equipment intended for use, specify the media of input and output, state volumes of data, calculate timing for the operation, and relate the next step in the normal series of operations. Process chart symbols can be made informative by graphic subdivision and assignment of areas for specific details.

The circles above and below each file state the source of the file for inputs, and the destination for outputs. The information contained in each circle can be a number specifying a run number or, K/P for key punching, C/T for card-to-tape converter, T/C for tape-to-card converter, etc. If additional extensions are used, such as a drum, they may be added. All of the symbols, by their shape, immediately suggest what unit is intended for use. Further, they are placed on the process chart in a manner to emphasize the relationships between the units used. The symbols also lend themselves to the imagination of the user, and if the user wishes he may make them more flexible for the purpose of conveying whatever other information must necessarily be detailed in the process charts.

The name of the files, in each case, as the volumes, are not difficult determinations. They are the product of the original study made of the existing procedures. To resolve the timing for each of the runs designed by process charts will depend entirely on the computer and peripheral equipment selected. There are differences in the timing used to calculate the over-all time between the variety of equipment supplied by one manufacturer, and between manufacturers. Consequently, to determine the time it takes to complete operations it becomes necessary to calculate timing by individual operations first. Further distinction between units of equipment is that some operate in microseconds and some in milliseconds. These distinctions emphasize the need for the analyst to be fully acquainted with the computer and peripheral equipment selected in all their various modes of operation.

Record layouts, sub-routines, operating instructions—where to start? The plague of new computer groups invariably seems to be the inability to *"find the handle"*. This temporary lack of confidence in newly trained programmers has a distressing effect. Morale sags, the new programmer is overcome with a feeling of incompetence and visions of permanent obscurity. Such feelings are only temporarily justifiable. But the temporary state can be prolonged if the newly trained programmer does not avail himself of the helpful literature and experienced personnel provided by the computer manufacturer.

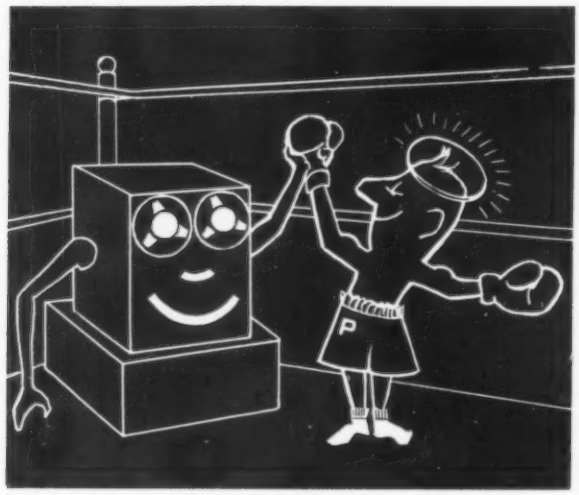
**Developing the programmer**

One of the most formidable obstacles to the development of the new programmer is his inability to adapt himself to the new thought processes necessary to execute the formulation of computer programs. Dr. John C. Sherry, associate professor of Social Sciences, Pace College, New York, says that the student desirous of entering courses of automation should have the "aptitude and interest in the highly specialized work of programming."[1]

Perhaps the most significant quality for success in a potential programmer's makeup is that he be unopposed to change. Any one program can require any length of time of constant application before it accomplishes its goals. It requires infinite detail in development. Once completed, errors may appear which require a re-evaluation of the problem, starting a completely new cycle of development. For the average person this would seem staggering, especially when the time and toil that go into programming are considered. The programmer, however, is a special breed who can take a setback of this kind in his stride. Programming failures are often rewarding in themselves because they may shed more light on the subject. Errors are contributions, just as accomplishments appearing in trade magazines or any media used as a source of idea exchange are, to the furtherment and completion of a program and the programmer.

The accomplished programmer accepts challenges and delights in his joust with systems problems.

[1] "Education for Automation," Systems for Educators, Volume 4, Number 3, January-February, 1958.



He has in his corner the greatest advance of our time, the computer.

No implication is intended that the new programmer or the student need adjust himself to accept a fact that his efforts, if he wants to progress, be monumental. It is stressed that this programmer should accept the responsibility for his development with the proper attitude: honest effort and application.

### Areas of investigation

The areas of investigation at the inception period in the development and analysis of commercial systems for electronic data processing applications are manifold:

1. The re-evaluation of the proposed system with the present operation.
2. The development of record layouts for processing, keeping in mind the unique capabilities and limitations of the central computer and the input-output devices to be used in the system.
3. The development of new process charts or systems design.
4. The development of detailed technical flow charts reflecting the working of the computer. This is followed by thorough analysis and a redevelopment insofar as is necessary.
5. The detailed coding produced for internal programs and wiring for external programs. Here again a thorough analysis follows.
6. Program testing, sometimes equal in length to the programming, is to many programmers the most dynamic stage since it is but one step from a complete and test proven systems design. Program testing can be less time consuming than programming if thorough and proper effort has been given preliminary stages of operations which ultimately led to the testing.

These are just a few of the areas to be covered by those involved in a new installation. There are other important projects such as site planning, research into new filing systems for new methods of intelligence storage, e.g., physical tape control.

It is not unusual for any newly trained specialist to be without confidence at the start. There is a beginning for everyone, a period during which we all learn the ropes. However, with sincere curiosity, with the desire to do a better job, through serious search, research, and consultation with literature, technical assistance, and the services provided by the computer manufacturer, that company and its programmers will not remain without confidence for long.

### Director of EDP

The organization is basic and essential. Where there are many braves and no chiefs a situation develops by the emergence of many chiefs; a situation which is bad for morale, production, and organization. There is an obvious correlation between these factors. To avoid this it is necessary to develop a chain of command with the establishment of job titles having appropriate responsibilities and weight.

Often the man selected to direct the electronic data processing group has been in a similar capacity in the punched card data processing room of the company. This has been considered to be a likely choice for evident reasons. However, when such a man will not relieve himself of his former duties and also assumes programming assignments he makes a mistake. He unwittingly compromises his role by assuming a competitive position with those of lesser authority in the group, thereby damaging his directive status and authority. As a result, both he and his staff are confused and flounder about until someone is put in command.

The director of data processing must be capable of assuming a position of authority and must be able to command the respect of those working with and for him.

The organizational structure should stabilize the relationship of the people within the working group, give the over-all production solid meaning at all its phasing points, promote incentive, and create an atmosphere of unanimity while everyone assumes a distinct role. Obviously, the over-all direction must emanate from the director of EDP. He should be selected on the basis of his proven ability in management as well as his knowledge of the systems problems at large. Training should be provided for this individual in the computer course of the manufacturer contracted.

### No lesser duties

One of the great pitfalls at many installations is the assignment of programming duties to the director of EDP. This is unreasonable. This person must become acquainted with the intricacies of the com-

puter, but to confine him with a program is to make no use of his executive abilities. There are many areas of investigation that require his time and careful planning. In order that he may engage in these important decision making areas, the director of EDP must be free of routine work.

Some of the issues that will require the analysis and study of the director of EDP are:

Contractual obligations with the computer manufacturer,

Installation cost,

Machine requirements,

Air conditioning cost and requirements,

Division and delegation of developmental assignments,

Scheduling computer program test dates,

Production scheduling,

Forms design for computer room traffic control,

Personnel,

Future applications and expansion,

Reports to superiors, etc.

It becomes apparent that the director of EDP cannot be effective if he becomes relegated to a lesser role by the nature of the duties he is to perform. It should also be apparent that the man required must have executive qualities and capabilities; he must be a leader. With the cooperation and participation of his staff leaders he should attempt to design a course for progress. This can be done by developing a schedule for projects that have been firmed up.

#### Internal buildup

He can also assist those people in authority in areas outside of the computer department, who are affected by it, in becoming better acquainted with the immediate and future purposes of electronic data processing in their company.

Where all departmental executives are enlightened regarding the mysteries of the EDP department there is more apt to be understanding, cooperation, and acceptance. To help everyone else understand what EDP means, a company education program can be set up using films, slides, and company executives to make presentations to the entire organization. Through better understanding the people in various activities will come to realize that new and better opportunities will be created, as well as profits and services to the company. Morale and personnel can easily be jeopardized in an atmosphere of uncertainty. The role of EDP and its place next to other commercial activities must be sold right down the line.

#### Technician's services

The EDP director should consult with the computer manufacturer's technical support representative whenever necessary. That representative is assigned to the EDP director as an advisor. Together he and the director can disseminate information to analysts, programmers, and computer operators; he can outline seminars, and bring to the organization all of the techniques developed to date by the industry. The technician's services should be made available to all those in the computer area. He should have direct access to the director's office. Through the technical advisor, the EDP director may be made more professionally aware of progress, approach and occupational needs necessary to sustain maximum organization and efficiency.

The keynote of any successful undertaking is organization. The talents of any group, however superior will be wasted if they are not properly coordinated and directed in a common and concerted effort.

#### Objectives

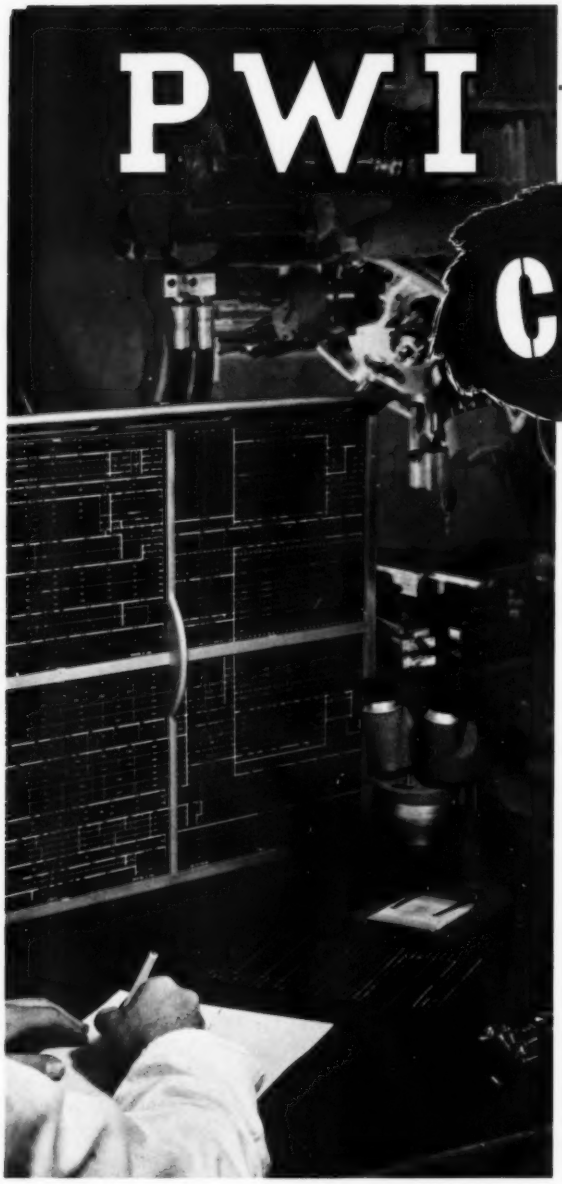
An activity must have a clearly defined objective. Then whatever dynamics are necessary can be exerted to the fulfillment of the objective: Establishment of management controls, standardization of operation procedure, creating work schedules. A planned schedule for each individual or team should be made. Target dates can be imposed for job completion and progress status maintained by individual or team. Individual efforts should be organized for a common end. For example, no computer program need be considered complete, properly analyzed, and tested until it is finished in its entirety, bound in book form, and properly labeled.

A completed program book might contain the following in the specified order:

**a.** Process or systems chart
**b.** Generalized computer flow chart
**c.** Detailed computer flow chart
**d.** Detailed coding *(handwritten)*
**e.** Item layouts
**f.** Computer operating instructions
**g.** Corrected machine listing of the coded instructions.

Only three facets of EDP have been surveyed here. However, these are the activities that conceive, nourish, and rear all of the functions of EDP, present and future. It is important that in these areas a firm foundation be laid from which a sound organization may be allowed to grow. Judgment must be exercised in the enlistment of personnel. Responsibility must be delegated for systems design to those people most qualified, who are keenly aware of the company's standard operating procedures. Every avenue possible should be opened toward better organization, education, and the efficient implementation of people and machines.

■ ■ ■



# PWI

*. maker of fine instruments...*

# certifies

# every panel

**issues you a certificate... proof... a guarantee of highest quality, durability... of positive performance, even after years of use!**

Every certified panel is completely fabricated within PWI's modern, automated plant equipped with programmed automatic machine tools for the manufacture of precision products and instrumentation. Every panel is "on gauge" with a micro-tolerance master prototype... must meet the exacting requirements of the many test stations located along the PWI control panel manufacturing and assembly lines.

Every part... all raw material... wear-resistant aircraft type aluminum alloy... every high-impact-strength molded insert... conforms to rigid quality-control standards.

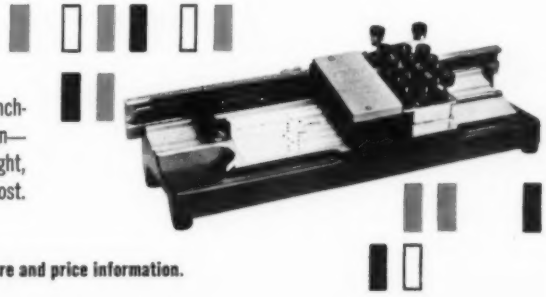
Only a manufacturer who has complete in-plant control of his entire manufacturing cycle can guarantee such enduring quality. PWI... maker of fine instruments... does this.

**A complete line of self-contacting control panels and wires • Key punches • Gamma filters • Wiring tools • Accessories •**

## "001" KEY PUNCH

PWI "001" Auxiliary Key Punch... simple, convenient means for punching numerical data into standard tab cards. Standard keyboard design—tab stop—quick release—simplified skip mechanism. Light in weight, easily carried. Highest quality—built for years of service. Nominal cost.

**Circle No. 9 on Reader Service Card.**



**Write for descriptive literature and price information.**

**PWI** *Panels Wires Incorporated.*

213 EAST GRAND AVE., SOUTH SAN FRANCISCO, CALIFORNIA

# NEWS SUMMARY

## GENERAL

**Financial Reports**

*Wilson Jones Company* reported that net income for the nine months to July 31 rose to $423,000 from $238,000 in the first three quarters of the preceding fiscal year. On 328,396 shares outstanding in both years, earnings of the Chicago-based manufacturer of record keeping forms and supplies advanced from 72 cents to $1.29 a share. Sales were $12,962,000, compared to $12,954,000 in the year previous.

Consolidated sales of the *Electronic Engineering Company of California* totalled $1,665,000 for the 25 week period ending June 26. Sales for the three month period were nearly double the first three months of the year—$1,020,000 as compared with $645,000. The company supplies electronic timing and data processing systems products to the armed forces and private industry in addition to developing instrumentation timing systems, data communications systems and test ranges.

Expansion at Minneapolis-Honeywell's *Datamatic Division* at Wellesley includes another 25,000 square foot office building to be ready at year end. Employment at the Datamatic division is expected to more than triple during the current year; already more than 1500 people have been added to the payroll.

## NEW APPLICATIONS

**Fully Electronic Bank**

The First Pennsylvania Banking and Trust Company—the nation's oldest and Philadelphia's largest bank—has installed a full automatic, electronic *bank bookkeeping* system, produced by Burroughs Corporation. The system includes 25 account and amount numbering printers, three check sorters, console control to three magnetic tape unit readers from sorter, two 220 computers, one multitape electrostatic printer, and two hi-speed printers. This eliminates bottlenecks in handling the 600,000 checks received daily. A total of 175,000 customer checks and 25,000 deposits are posted daily, creating a sizable paperwork problem.

Doubleday Book Club uses a Scriptomatic Model 10 RCS addressing machine to read, compare and sort Remington Rand punched card *records of book purchases* simultaneously with the *addressing* operation. The machine consists of two card reading heads, two card sorters and an invoice printing station.

**Air Control**

Burroughs displayed a beacon decoding instrument developed for the Federal Aviation Agency's studies for the *control of air traffic*. The equipment is designed to provide the Air Traffic Control Radar Beacon System with positive target identification, target identity readout, actual pressure altitude readout in 250 foot increments with corrections on the ground, altitude zone from zero to 100,000 feet in increments of 1,000 feet, and elimination of false targets and false readouts.

## MILITARY NEWS

**Navy Computing**

Remington-Rand has produced for the Navy a new compact computing system which collects, processes and evaluates *naval tactical data* and recommends courses of action in virtually zero time. The Univac Advanced Navy Computer is a general-purpose, stored-program machine with very high speed random-access memory containing one million bits of information. It is of modular construction, the entire unit measuring only 3 x 3 x 6 feet.

**Translating with Photography**

Photography is the key to success of the Air Force's new *translating* machine that changes Russian to English at the rate of 40 words a minute. Eastman Kodak Company coats special glass disks with high-resolution photographic emulsion. Through photography, an entire 55,000 word vocabulary is stored in a ⅜-inch channel printed on a ten-inch glass disk. The channel is scanned by electronics until the machine matches a Russian word—fed in with punched tape—to its English equivalent, which is then printed automatically on a typewriter. A Kodak research scientist disclosed that high-resolution film, exposed with present optics, is capable of storing 600 million bits of information per square inch.

◀ By coupling an NCR Class 31 bookkeeping machine to a card punch machine, Maryland Shipbuilding & Drydock Company posts inventory ledger and punches cards needed for distribution analysis simultaneously. Machine methods permit inventory changes to be recorded seven hours after they occur and allow books to be closed weeks earlier at end of month.

# Inventory Control for Shipbuilder

## Automated control system spots shortages automatically

MARYLAND SHIPBUILDING & DRYDOCK COMPANY of Baltimore needs only four girls to keep track of a 9,000 item inventory which involves up to 1400 additions and withdrawals a day. Additions and subtractions to stock on hand are recorded no more than seven hours after the change occurs and the system automatically flags supplies that are too low.

Inventory records are updated daily. The record keeping job is essentially three runs: One for purchase orders, one for receiving tickets, and one for stock withdrawal requisitions. This is done on four NCR Class 31 bookkeeping machines connected by intercoupler to a card punch.

The stock quantity listed on each purchase order is posted to the *on order* column of the appropriate ledger card; then, when the shipment arrives from the supplier, a copy of the receiving ticket goes to the machine operator. She reduces the on-order figure and increases the on-hand balance. When the item is requisitioned, the on-hand balance is decreased and the amount of the withdrawal is added to a cumulative usage balance.

During the purchase order and receiving ticket runs, the machine is not connected to the card punch since punched cards are not required.

### Daily reports

The detail cards, after sorting and merging with another deck, are run through the accounting machine to produce a daily report showing the quantity of stock withdrawn for each job in the shipyard, classified by inventory class and item. The listing for each item gives the latest withdrawal and also the cumulative usage for the month-to-date. The usage figure is obtained from the summary cards comprising the second deck. These cards are updated simultaneously with preparation of the daily report. At month end a similar listing is prepared, just from the summary cards. This report supplies the totals which are posted to the company's detail cost and general ledger inventory accounts.

The company formerly posted its inventory records entirely by hand, using file cards for the item records and huge columnar sheets for the distribution. The new system allows the company to close its books by the sixth working day of the following month, whereas previously it had taken up to the 20th.

Empty stock bins and shelves are no longer a threat because withdrawals are posted within a day after occurrence. Previously it had taken four to five days before posting was accomplished. This had required over-large inventories as insurance against shortages.

### Automatic signals

Perhaps the most interesting feature of the M.S. & D. inventory control system is the way in which the machine automatically signals when inventory items are running low.

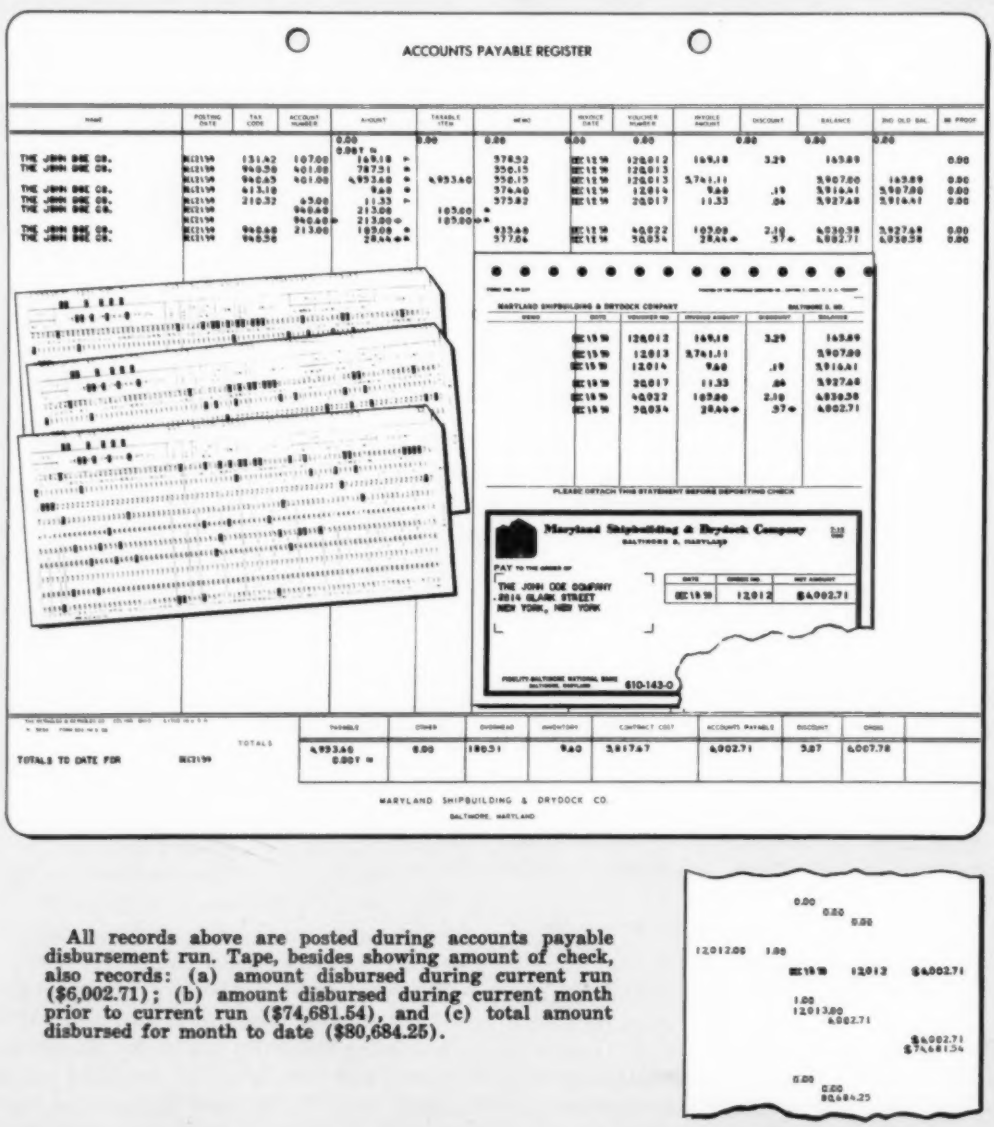
During the requisition-posting run, each time the NCR machine records a withdrawal, it automatically compares the new on-hand balance with the minimum stock requirement for that item. The difference between the two figures is then printed on a second tally tape of the machine. If the balance is greater than the minimum, supply is still adequate, and the figure is recorded on the tape in black. But if the new balance is less than the minimum, the tape shows the figure in red, calling attention to the low status. At the end of the day,

after all requisitions have been recorded, the inventory department locates the items that have to replenished quickly by checking the red figures on the tape.

### End of year procedures

Minimum stock requirements are reappraised at the end of the year by checking the usage column on each inventory ledger card. Machine posting has greatly simplified this task. Formerly, when file cards were used, only the individual amount of each requisition was shown, which meant that a tedious adding job was required to get the totals for the year. It is this total amount which the company needs to make decisions on stock minimums. Now the cumulative figure is in the usage column each time the machine posts a withdrawal.

Another end-of-the-year procedure that has benefited from the new system is the preparation of the annual physical inventory report. Formerly, it took two typists a week to enter descriptions of the company's 9,000 inventory items on the sheets used for the physical count. Now all this data is recorded on a master deck of punched cards; reports are prepared in an hour and a half of machine time. The task of adjusting the inventory ledger to conform with the physical count has been reduced by one-third. ■






All records above are posted during accounts payable disbursement run. Tape, besides showing amount of check, also records: (a) amount disbursed during current run ($6,002.71); (b) amount disbursed during current month prior to current run ($74,681.54), and (c) total amount disbursed for month to date ($80,684.25).

RAY MARIEN

# How Not to Sell Business Forms

MR. FORMS SALESMAN—if you want to sell your product to the printing buyers of American industry you had better stop reading at this point. This month's column is purely negative. It's for those salesmen who aren't interested in doing business with purchasing agents. This will be right in line with their present approach.

First, if you really don't want to sell forms, you should try with all your might to impress the buyer with the magnitude of your operation. Tell him such things as this:

"We coat all our own carbon paper, it gives us positive quality control."

Or this one:

"Our plants are equipped to produce everything from thermographed business cards to 200 page catalogs in rotogravure. That's why business forms are a cinch for us."

And as the crusher:

"We've got plants everywhere. Snails Trail, Idaho; Woo-Hah-Wah, Wisconsin; Birds Nest, Texas—everywhere!—That's how come our service is so good!"

That's a one-two-three punch that should convince him—to do business elsewhere! Of course this approach is no good if you *do* have the plants and facilities mentioned, but who does?

### Fake it

Next, even if you don't really know systems forms as well as you should, *fake it!* Unfurl some flow charts and twirl a roll of 5-channel tape around your finger while you lean back and discuss the programming of a solid state computer that you did for your last customer. Chances are your *last* customer passed away long before your prospect was born, but he'll never know that. To really convince him, keep prattling on in I.D.P. jargon. It's guaranteed to fail!

Another tried and proven method of not selling business forms is to have an active sideline. When the buyer seems weary of listening to your forms chatter, break out some cardboard boxes, or carbon and ribbon samples. You might even try selling him paper cups. He'll appreciate that, if he's thirsty. This way you'll assure him that you would love to have his business, even if you only land the floor-waxing concession!

Perhaps you've been up against stiff competition, maybe some great big, mean old printers are getting the bulk of his business. In that case, all you have to do is *knock*. Not on the door, mind you—*knock your competition*. Tear them apart, accuse them of every black trick you can think of, failure to meet delivery, typographical errors, short-shipping, beating their grandmothers, and so on. Then, don't forget to add that you worked for them for 20 years, and they only turned mean overnight, *after* you left them. Maybe they were bitten by a rabid printing buyer or something.

Another tip—be sure you see him only *after* you've tried to sell forms to everybody else in the organization, such as the office manager, the data processing supervisor, the file clerk and the stockroom boy. He'll appreciate the fact that you've cleared it with them first.

### Pile it on

Never, *never*, be brief when you call on a busy buyer. If you see his desk piled high with papers, peer over the top and shove a few dozen samples at him, one at a time. Better yet, if he's besieged with telephone calls, sit back and nod sagely at his conversations, especially the one with his wife. You'll know that one because the earpiece will be smoking and staccato screeching noises will be bouncing off all four walls. When he pauses to catch his breath during these calls, slip in some quick advice. One sure-fire line is this: "Tell her to go back to her mother, you can't afford a new dress!"

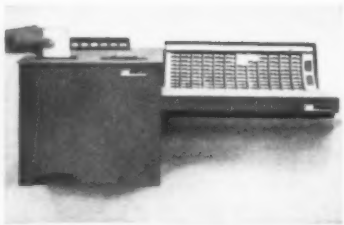
Take him out to lunch. But first make sure that the company cafeteria is open. If perchance the menu there doesn't appeal to you, take him to a six stool luncheonette where the grease spatters from the hamburger grill can beat out a merry tune on his tie. Don't, under any circumstances, buy him a martini. Assume that no buyer drinks, period. If his red-veined nose indicates otherwise, tell him your ulcer is bothering you so much you can't even watch *others* drink.

I believe by now you have a pretty good idea how not to sell business forms. But—if all these tips should prove ineffective and you *do* get an order, don't despair. Counterattack by following these sure-fire measures:

1. Change his specifications without telling him. This can be fun.
2. Make him call you twenty times for action on a rush delivery that's three weeks overdue.
3. Never submit proofs—it's a waste of time. Nobody ever looks at them.
4. Always give him short-ream packages—say 350 forms in a box labeled *500*. No one ever *counts* forms.

If you still get the business after all that, then brother, you *deserve* it! ■

# New way to get a bird's-eye view of an industrial plant



**Now data from strategic points throughout a factory can be reported to a central location simultaneously. This is IBM TELEPROCESSING with the new 357 Data Collection System.**

The IBM 357 Data Collection System gives management current, accurate information needed to meet rapid changes on the factory floor. And the system has just been made even more flexible: It now accepts identification data from employee badges that also serve as conventional plant badges. A new input keyboard has

also been designed specifically for an industrial environment.

Here's how this IBM TELE-PROCESSING system works: A worker in a plant finishes a subassembly. He puts an IBM card in an electronic device no larger than a typewriter and keys in information about the completed job. The production data is flashed instantly to a central receiving station. At the same time, facts flow in from similar input stations throughout the plant. All this data can feed into the plant's central data processing system.

Can an IBM TELE-PROCESSING system help you? Facts must be "live" to be of use in management decisions. IBM TELE-PROCESSING systems move data fast to where it's needed, whether the distance is a thousand yards, a thousand miles, or more. Ask your IBM representative about the new advances in TELE-PROCESSING systems and how they can extend management control over rapidly changing business operations. Data Processing Division, International Business Machines Corporation.

Circle No. 10 on Reader Service Card.

**IBM® TELE-PROCESSING** Trademark

By Douglas D. Hubbard

# Electronic Data Processing—Translated!

## A review of basic principles which explain some of the mysteries of computerese

AT A MANAGEMENT LEVEL you can not escape the subject of electronic data processing, for whether or not you are interested in it personally, professionally you are confronted with it everywhere. Enough material has been, is being, and will be published on various aspects of electronic data processing to choke a herd of wild horses—and this writer is acquainted with people in management and administrative capacities who are convinced that this would, indeed, be a most appropriate use for many of today's articles on this subject.

"Why don't they stop telling us *about* it long enough to tell us what it really *is?*" they groan. "We stand right on the doorstep of all this complicated business, but where's the door *into* it? We don't care if we can't be programmers or electronics engineers—we just want to understand what the whole thing's all about. Isn't there some common ground where the men who design and manufacture these 'electronic brains' can meet with auditors and treasurers, vice presidents and comptrollers? Must we always appear beneath the intellectual level of the specialists and technicians who know their way around so well in this electronic data processing world that we find so mysterious?"

Based on the belief that there certainly *is* a common ground of understanding, and that executives are not obliged to forsake dignity or prestige by admitting they know very little about a field as technical as electronics, this article will attempt to serve as a doorway into what too often is regarded as a bewildering world of formidable specialization. Just as every man does not have to be a mechanical engineer to drive a car, neither does a man have to be an electronics engineer to learn about EDP. First of all, what are we saying when we say, "electronic data processing"? Well, let's not make it complicated—we're simply talking about processing data by a means or method which happens to involve the rather extensive employment of electronic apparatus. Whether we're concerned from a business, scientific, or engineering standpoint, usually one of two things—sometimes both—has brought us to EDP: **(1)** Highly complex problems requiring so many intricate calculations that manual methods of solution are too time consuming to be practical, or **(2)** Such a mountainous work load of clerical type activities that the staff that performs them is dragged down by its own weight.

So a basic fact is established: Speed, above all else, is a most sought after ingredient for solving either a few very complicated problems, or a great multitude of easy ones. And speed, of course, brings us to electronics.

### Analogy

If we can, for a moment, mentally regard an electronic computer as just a great big vat with a white pipe running into it and a black pipe running out of it, we'll perhaps find it easier to discuss. Let's say that the vat itself is a kind of magic place where, when sand and water are poured into it through the white pipe, gold is produced. We don't at the moment care *how* this is done—we just accept the fact that it *is*. After the gold is produced, it comes out of the vat through the black pipe and piles up at our feet.

The white pipe, through which we poured the sand and water, we're going to call "input." The black pipe, through which the finished product left the vat, we'll call "output." The vat itself,

we'll regard as the "computer." So we're on our way. We put things into the computer by means of input and we take things out of it by means of output. The computer itself will accept as input that which we furnish to it and it will deliver to us as output whatever we have requested in the way of answers.

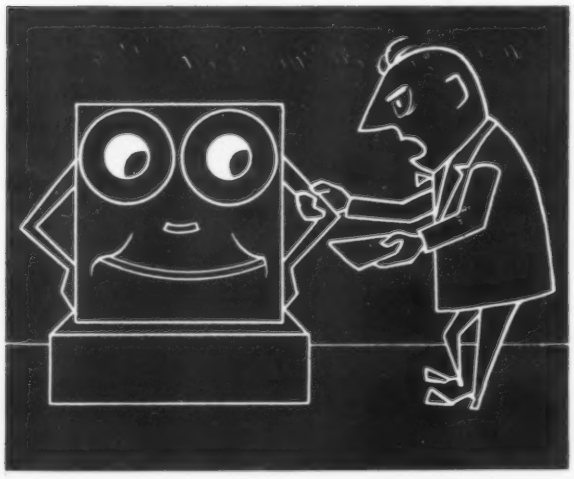
In weaving realism into the analogy let's now regard the input as some sort of electrical input—we don't care, really, *what* kind—it's just electrical. Output is also electrical. The vat, which became our computer, is now an electrical computer with all of the things that function inside it electrically operated. But the basic difference between something electrically operated and *electronically* operated is speed, and speed is what we're after, so let's replace our relays and the mechanisms that operate them with vacuum tubes or transistors. Now we've got an honest to goodness electronic computer and we're ready to talk about it in more realistic terms.

### Basic steps

Any electronic data processing system includes four basic steps:

**1. The translation of human language to machine language.**

We *must* be able to communicate with the computer in some way to furnish it with the raw material with which to work. In our beginning example we fed sand and water to the vat through the white pipe as input. In reality we send information into the computer in several ways, all of which are defined as input. The common ground between human language and machine language is that point at which information is prepared and stored in a medium acceptable for "reading" by the computer. Let's make it sound complicated by saying that these are called "external data storage media." Now if this was an accumulation of information that we wanted to convey to *people only*, it could be stored in the form of books, movie films, phonograph records, or any of the other means we use to present information to each other as humans.



Since, however, these forms of storage are not acceptable to the computer, it is necessary to use ones that are. So, as far as the computer is concerned, stored information that it will accept as input is found primarily in punched cards, punched paper tape, and magnetic tape. The first of the four basic steps of an electronic data processing system, then, is the conversion of information on source documents to some external data storage media that can be used as input whenever desired.

**2. Process.**

This step is covered by just one word, and it's something like saying "mankind," or "universe," from the standpoint of the gigantic meaning it has. We said a while back that when sand and water were poured into the vat through the white pipe, gold was produced. We said then that we didn't care *how* this was done—it was just *done*. Now we care, because the vat has become a computer to us and the white pipe has become input in the form of punched cards, punched paper tape, or magnetic tape. The sand and water have become the *information contained* in the external storage media of cards or tape. So now, instead of regarding the innards of the computer as just a magic place where something is done, we're going to concern ourselves with *how* that something is done—and though it is a little discouraging to have to face it, there isn't any magic. It is all very logical.

Just as there are external data storage media, so are there also *internal* data storage media. This is simply to say that there are built in facilities inside the computer to accept and store information received as input. There are various types of internal storage—magnetic drums, magnetic disks, magnetic cores and others, but they are all media of internal storage, and without this characteristic, computers would be quite valueless. What we're saying, then, is that it is possible for us to take all of the many, many details concerning any of the problems or applications with which our firm is concerned, and store them in the computer. We'll call this, "reading into storage," and regard it as roughly equivalent to filing reams and reams of paper—each sheet of which is individually vital as an identity and purpose—into an immense filing cabinet, properly catalogued and labeled. Right at this point the basic element of the whole electronic data processing idea makes itself felt, for the *speed* with which we are able to accomplish this "reading into storage" puts the show on the road. Information races around from one storage location to another inside a computer at the incredible rate of *millionths of a second*. The most effective way of

grasping the significance of this is to mentally compare the action of a computer searching through tens of thousands of details stored within itself—and finding what it's looking for in a couple of *millionths* of a second—to a poor, mystified clerk who plods and probes through that immense filing cabinet we mentioned, trying to locate one individual piece of information out of all the rest. This "process" step includes instantaneous addition, subtraction, multiplication, and division of factors in storage. The process step boils down, really, to just what the word itself means—whatever is necessary to do to arrive at an answer or a desired end, the computer *does*. But again, there's no magic to this. It's simply the result of programming, a subject we'll come back to a bit later.

**3. The translation of machine language to human language.**

Regardless of how effective the computer is at solving problems and coming up with answers at fabulous speed, unless there is a way of *reading* or *recognizing* or *capturing* these answers in some external storage media, the whole affair has been all for nought, so the step of translating its language back to some form of human language is imperative. This translation is accomplished by various outputs. Printers, punched cards, punched paper tape, and magnetic tape all serve as external storage media either for solutions to problems that the computer has calculated or information it has searched for and located in storage. In the case of printer output, a complete story of what shape your whole business is in and why can be written in minutes, and the other forms of output are even faster. If output is in the form of cards or tape, the information therein can be used for printing reports at a subsequent time, and the cards or tapes themselves can be used as input to the computer for compiling or calculating other data. The translation of machine language to human language, or output, with regard to our original analogy, is the equivalent of the gold coming out of the vat through the black pipe. The information or answers we get out of the computer in the form of punched cards, tape, magnetic tape or printed reports are the computer's finished product.

**4. The establishment of control over all phases to check the accuracy of output.**

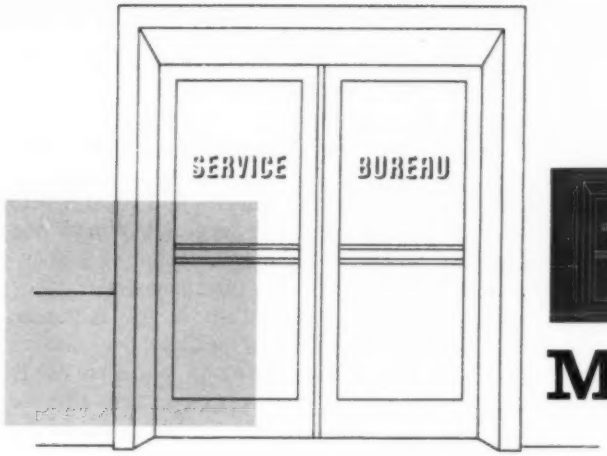
Now it doesn't matter how incredible the computer's speed is or how many complex calculations it has made to arrive at the answers if we can't depend on the *accuracy* of these answers. So *control* is very much a part of an electronic data processing system and it takes many forms. The manufacturers build into their computers provisions whereby the computer's every operation is double checked by itself and if a failure of any kind is discovered, immediate notice is registered by the computer in the form of lights, punches, symbols, or other significant signs.

Material prepared for input to the computer is assembled so that crosschecking, subtotaling and balancing to various control figures down the line will verify the accuracy of the computer's calculations, and the sequence of the computer's calculations itself revolves to a large extent around control. This brings us back to programming, which was mentioned during the "process" step; it is quite impossible to consider electronic data processing in a realistic sense without recognizing the significance of programming.

A computer is a highly complex, versatile unit of electronic components that performs at an incredible rate of speed and efficiency, but as said before, it really isn't magic. It has to be told what to do—exactly, and specifically, and this is known as programming. Programming simply means telling the computer what individual steps to take to solve a problem, taking into consideration every conceivable variation and possibility that may occur in the course of solving the problem, and providing alternate steps for exceptions to the rule. These instructions are "read into storage" in the computer and extensive trial runs are made to prove the adequacy of the instructions. When it has been established that all conditions have been considered and prepared for, the job is said to have been "programmed" and the rest is left up to the speed of electronics.

So the fabulous speed with which the computer goes through its operations is combined with a great deal of methodical preparation and groundwork, and much of the thought devoted to programming is connected with control. In every area of electronic data processing *control* must be omnipresent. Without it, we're better off with the poor, tired clerk searching through that big old filing cabinet for answers.

There is so much to the subject of electronic data processing that whatever is said concerning it is still only a small part of the whole picture, but an understanding—or at least a recognition—of the points we have discussed herein is essential for a grasp of what electronic data processing really is. The reader is reminded that many times a quest for knowledge depends to a larger extent on the pertinence of the questions concerning a subject than the copious quantity of material available on it. It is therefore recommended that the person interested in assaulting the barriers of this field begin by recognizing external and internal storage media, input and output, and programming as basic components of electronic data processing. Admittance to the ever-widening circle of those who understand this field can best be gained by using these basic components as ports of entry.■



# Modern Controls

**Business and accounting controls possible through use of service bureaus.**

JAMES WERNER, Director of Purchases at the Simpson Electric Company of Chicago aptly put it, *Get in it, or get caught by it*—his reference being to business men outdistancing their competitors by taking full advantage of electronic data processing equipment and systems.

Business automation was the theme at a recent National Association of Purchasing Agents Convention. Speaker after speaker stressed the need to develop sharper inventory procedures to satisfy management's clamor for lower costs. There was general agreement that while this was requisite and necessary, few companies could achieve this goal due to the tremendous amount of paper work involved. The data processing experts attending the convention did not agree and accused the purchasing agents of virtually ignoring the major tool that could help free them from paper shuffling chores and allow more time for big league buying decisions.

**By Frank Embs**

Ray Eppert, President of Burroughs, stated recently that no company handling large amounts of paper will be able to increase its processing of information, without hurting profits, until it automates. Further, he stated, *if any corporation thinks they are going to play the same kind of game as in the 50's they are dead wrong.* In the years ahead as never before, management will have to concern itself with information; collecting it, transmitting, or interpreting it, and storing it.

There are any number of major reasons for considering data processing techniques. With clerical and accounting costs rising year by year, the alert competitor will give thought to cutting his overhead costs and sharpening his inventory, billing, and marketing techniques through the use of data processing systems now within the reach of even one-man organizations.

Companies become more competitive as they eliminate slow, error prone manual methods that lead to customer complaints, and cancelled orders.

### Higher personnel costs

Personnel costs will continue to rise, while the cost of machines will tend to decrease in price as increased volume and competition among the machine makers increase. Fringe benefits appended to your payroll which too often are ignored will also continue to increase. This is a cost factor not present in cold, impersonal machines.

The businessman who seeks and makes full use of this modern technique will out-distance his slower moving competitor and reap the benefits of his progressiveness.

Charles H. Johnson, Vice President of Data Processing Incorporated, Elgin, Illinois, said recently, *Any organization, fighting for its survival, must be able to change direction quickly and efficiently. For a company of any size, this can only be accomplished with the aid of automation, in the plant and in the office. We believe data processing centers are requisite and necessary in this auto-*

*mation program, not only in the servicing of small companies who cannot afford a data processing installation of their own, but in the testing of new techniques and equipment for larger firms who want to approach the problem of automation.*

**Service centers**

There are many good reasons for companies to use service centers. In addition to speed and accuracy, a service center normally will handle high volume jobs expeditiously and at low cost. The fine systems work these centers provide for their clients is a benefit that smaller companies, lacking a systems department of their own, cannot afford to overlook.

Manual methods quite often can be used to obtain limited information economically. This level of information is such that the businessman is no better off than his competitor. The same information put into a machine, however, gives data in depth which can be sorted, re-sorted, re-correlated, turned upside down and sideways to give valuable information about daily, weekly, monthly and annual operations.

Payrolls and possibly invoicing can be done manually at no more cost than by machine methods, but the machine information goes on and on, delivering data that is limited only by the demands of the user.

"Codo-MATION"
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"Codo-mation" is the art of selecting the correct ribbons for Data Processing Machines. When it comes to Tabulating equipment, no other ribbons surpass Codo's made with Perma-Jet ink. They not only give sharp, clear impressions and long life, but are the best for Thermo-Fax copying, too. Try some, and see!
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Circle No. 11 on Reader Service Card.


Integrated data processing techniques in combination with data processing service centers provide the benefits of punched cards without the expense of leasing, buying and maintaining data processing equipment. There are a number of adding, and bookkeeping machines and typewriters which produce punched paper tape and/or punched cards as a by-product of the origination of a document, such as an invoice or a purchase order.

A manufacturer's representative, for instance, takes the information sent by his less progressive principal and has the data put on punched cards at a data processing service center. From this he obtains information about his market, indicating which items are fast and slow moving, and other information his principal should be furnishing him.

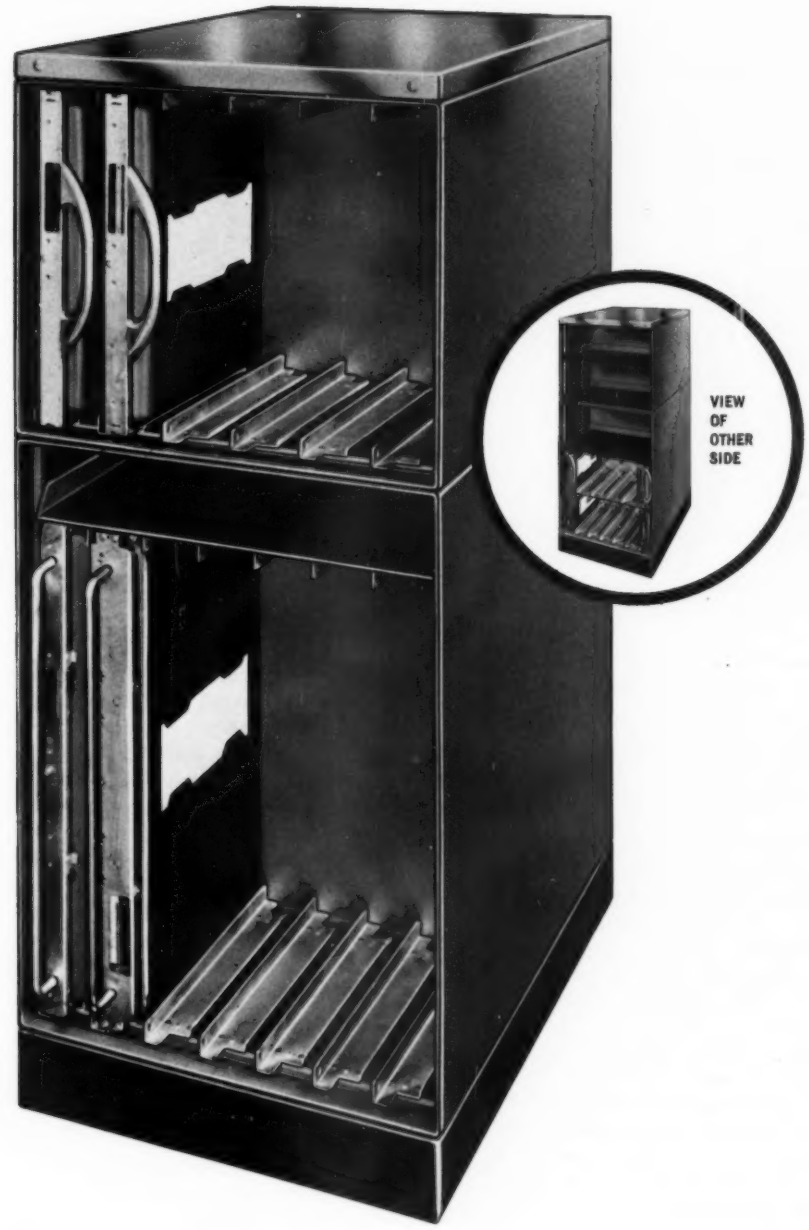
The principal could, with little or no extra expense, obtain this information for all his reps and for his own particular market requirements, as a by-product of his paper work procedures. Inventory control is another normal by-product of information recorded on a tape or card reading and punching typewriter. Order writing, payroll calculating, accounts receivable posting, accounts payable distribution, the accumulation of job costs; it's relatively easy to capture this information in punched card or punched tape form, as a by-product of an original typing function, then send them to a data processing service center for subsequent processing and the issuance of complete reports.

**False barriers**

There are two false barriers raised against service centers, one, the desirability of keeping information confidential and secondly, the empire builders who want to hoard machines and men. Service centers today are given the same confidence given to any professional management consultant.

Progressive systems too often, but understandably, meet opposition from manual orientated personnel, empire builders, because of a lack of overall thinking and/or just plain hide-boundness, and must be sold to the organization over a period of time by almost relentless pressure from the motivating individual or individuals, depending upon where the opposition lies. Such a program should not be precipitously formed, at least not at the beginning. On the other hand, the alert progressive individual usually seizes a technique of this kind and is prone to run too fast and expect too much from the process in the beginning. One extreme is as harmful as the other and both should and can be avoided.

Generally, data service center managements have met all degrees of receptiveness of these systems and can pretty well guide the new venturer in this field. They welcome the additional business it will bring them and the new prospect should not hesitate to call on a service center for all the information and help he needs. ■




This is the new Diebold Modular Control Panel system. Shown here is but one of an almost unlimited variety of interior arrangements possible. In addition, you have a choice of three different cabinet sizes, drawer units, casters or stationary bases. And all these arrangements can be changed when an as your requirements change. The coupon will bring details without obligation.

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# New Equipment

## BURROUGHS E103 ▸

Burroughs Corporation has introduced a new desk size electronic digital computer developed for business data processing. This is the E103, whose appearance may put electronic data processing within the reach of many small and medium-sized businesses. The E103 will sell for $29,750, or lease for $875 a month.

The E103 combines all the features of the E101 (which is primarily for scientific and engineering), plus an accounting machine printer and a new control unit, which provide greater programming flexibility, as standard equipment. The E103 may have its capabilities further extended by optional paper tape and/or punched card equipment for input and output.

The general purpose computer will feature a magnetic drum memory with storage capacity for 220 words (12 digits plus sign), and built-in decision-making abilities. Simplified external pinboard programming permits use of the computer with a minimum of operator training.

The Series E machines fill the middle range between the Burroughs F2000, an electro-mechanical business computer, and the B251, 204 and 220 computers, medium and intermediate electronic data processing systems.

Burroughs believes that these desk size computers will be of special use to retail and wholesale merchants, financial institutions, industrial manufacturers and governmental agencies for day-to-day data processing and accounting.

Available for the E103 are a series of programs, developed by Burroughs systems specialists, for *sales analysis, payroll, labor cost distribution, tax billing, dairy route accounting, bond yield* and *interest projection tables.*

**Circle no. 33 on reader service card.**

## IBM 1401E—7330 MAGNETIC TAPE UNIT

A new system, the 1401E, has been designed by IBM for users who would like to convert from punched cards to tape, but who do not require high speed tape systems.

The key component is the new 7330 magnetic tape unit, which in a typical system will read data up to twenty times faster and write out results at sixty times the rate of punched card equipment.

The 7330 has complete tape compatibility and will accept tapes made on series 727 and 729 tape units. The unit has a simplified horizontal tape transport design to prevent tape breakage during input and output. There are two methods of checking: the vertical parity check for each column of bits and a longitudinal parity check for each record. These are made during both read and write operations.

Tapes may be backspaced over a record or rewound to the beginning of the reel.

**Circle no. 34 on reader service card.**

*(continued on page 36)*

**Comparison of IBM 7330 and 729-IV magnetic tape units**

| | 7330 | 729-IV |
|---|---|---|
| Maximum Read/Write Speed (characters per second) (inches per second) | 7,200/ 20,000 36 | 22,500/ 62,500 112.5 |
| Character Rate (milliseconds per character) | .139/.050 | .044/.016 |
| Record Density (characters per inch) | 200/556 | 200/556 |
| Use Six-bit Characters per Reel of Tape | 5,760,000/ 16,012,800 | 5,760,000/ 16,012,800 |
| Start-Stop Times (milliseconds) | 5 | 2.5 |
| Transistorized | Yes | Yes |
| Monthly Rental | $450. | $900. |
| Selling Price | $19,000. | $48,500. |

Now... "Home on Time" is a Habit!

**Carditioner in the Tab Department changes overtime to free time!**

Obscurely mutilated cards kept the "flow" out of this Tab Supervisor's department. Visual sorts always skipped over some of them. Machines misread. Machines jammed. Men and equipment sat idle. Often the day's work lasted into the night.

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**Send for new booklet!**
*See at a glance how Carditioner irons out cards, irons out the kinks in tab operations. Case histories on request.*

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Circle No. 17 on Reader Service Card.

# IBM 1418 OPTICAL CHARACTER READER

The solid-state IBM 1418 Optical Character Reader (left in photo) reads typed, printed or imprinted information from paper or card documents of varying sizes and thicknesses for direct input to an IBM 1401 computer. It can also be equipped for mark reading—in which vertical pencil or ink marks represent specific data determined by the format of the document.

The 1418 reader automatically converts numerical data printed with ordinary ink into machine language which it feeds directly to the magnetic core memory of the 1401. Here, the data is processed, and the results are produced by the 1401 system as punched cards, magnetic tape, or printed reports.

While the 1418 is feeding data to the 1401 core storage, the computer can perform a variety of simultaneous data processing operations, such as a high-speed tape-to-printer operation. The 1418-equipped 1401 can also be used in support of larger IBM data processing systems, since magnetic tapes prepared on the 1401 can be used as input to the larger computers.

The 1418 reads at rates up to 480 characters a second from as many as 400 documents a minute. Its operating speed depends on the width of the documents, the number of characters to be read from each form, and the amount of processing required by each document. It is the first optical reading machine to provide direct input from a conventionally printed paper document to a computer.

### Type and document specifications

The 1418 reader is designed to read numerical information and three special characters from documents printed with standard IBM 407 type (.093-inch height and ten characters to the inch). This type style can be printed on the IBM 407, 408, and 409 accounting machines, 1403 printer, or electric typewriter. In addition, 407 elongated type (.130-inch height and seven characters to the inch), commonly used by credit card imprinters, can be read by the 1418. In mark-reading, it will read marks made by ordinary pencil or dark ink.

The size of the input document to be read by the 1418 can vary in length, width, and thickness. The machine handles documents anywhere between 5⅞″ and 8¾″ wide. The height of the forms can range from 2¾″ to 3½″, and their thickness from .0035″ paper to .007″ regular IBM card stock. Within this range of acceptable dimensions for input documents, the 1418 can process printed data from punched cards and continuous card forms, as well as from most premium notices, imprinted charge slips, coupons, telephone bills, and tax notices.

The direct processing of paper and card forms by the 1418-equipped 1401 can mean a substantial saving in time and costs. It can eliminate the need for converting information from source documents into cards or tape before the data can be entered into a computer for processing.

### Path of documents through the 1418

Documents to be read are placed in a non-stop hopper which provides continuous feeding into the machine. Up to fifteen inches of paper, or 800 to 1,500 documents, depending on their thickness, can be loaded into the hopper at once. Two loading trays allow the hopper to be refilled with documents without stopping the machine or interrupting the reading operation.

Feeding of documents into the reader is under automatic control of the 1401 stored program. As the documents feed into the 1418, they first pass a separator, which prevents two or more forms from being fed together. Each form is individually aligned and fed onto a revolving drum, against which the document is held flat by means of a vacuum. As the vacuum drum revolves, the form passes the lens system of an optical reading station, with its full surface exposed for reading. The operator can adjust the lens system with a positioning lever so that data can be read from any desired line on the face of the document.

After being read, the documents are removed from the surface of the drum by a continuous belt. Each document is then fed into a sorter pocket of the 1418.

### Document reading

The machine optically reads data from a source document by an exclusive high-resolution scanning method designed to provide optimum character recognition with high accuracy and reliability. By analyzing considerably more information than is necessary for each character scanned, the 1418 can handle a practical range of print quality from printers, typewriters, and imprinters.

As a source document moves past the optical reading station from right to left on the revolving drum, it is flooded with light. Reflected light from the document is passed through the lens system onto a rotating scanning disk which contains a series of spirals, each made up of a number of tiny square openings. The light passes in turn through the

| Units and Features | Monthly Rental | Purchase |
|---|---|---|
| 1418 Optical Character Reader | | |
| Model 1- 3 sorter pockets | $2,600 | $120,300 |
| Model 2-13 sorter pockets | 2,900 | 133,800 |
| Additional Read Station | 125 | 5,450 |
| Mark Reading Station | 125 | 5,950 |
| Input/Output Adapter Feature (for 1401 Processing Unit, Model C, D, or E) | 100 | 3,750 |

disk as a series of images from each segment of the character.

The reflected light image is next directed to the surface of a photomultiplier tube, which converts it into electrical impulses. This output is then sent to a video amplifier, which automatically adjusts the signal for variations in the weight of printing and differences in background. The amplifier analyzes each successive group of scans of the character to be either black or white and feeds its results to a shift-register (or grid) where a character pattern is developed. As a character pattern passes through the grid, it becomes oriented so that it matches an internal logic pattern for one specific character. When a match occurs, the character is recognized and transferred to the core memory of the 1401 for processing.

### Equipment details

The basic reader contains one optical reading station, which reads data printed in a single type style from any line on the document. Either a second reading station or a mark reading station can be added as an optional feature. With two reading stations, the 1418 can read any two lines in one pass of a document through the machine. These two lines can be in the same or different type styles. In place of the second read station, a mark reading station can be installed to read pencil or ink marks from a second line.

The line or lines to be read by a 1418 can be selected by the operator with levers which position the lens system. Switching from line to line or from character reading to mark reading is under complete control of 1401 programming.

The 1418 reader is available in two models—Model 1 with three sorter pockets and Model 2 featuring thirteen sorter pockets. When not in use as an input unit for the 1401, the 1418 Model 2 can perform independent optical sorting of printed forms and cards. Both models contain the same circuitry for analyzing and recognizing the scanned character, console, and a CRT (cathode ray tube) character display unit. The CRT unit, located on top of the 1418, is used as an aid for making scanning adjustments and for checking systems logic.

The 1418, Model 1 or 2, can be used with any Model C, D, or E 1401 magnetic tape data processing system.

### Applications

The optical character reader has extremely wide applications. It provides the high-speed direct processing of printed source and re-entry documents and can lead to great economies in time and costs. Typical areas where the 1418 offers increased speed and efficiency are:

Air Transportation: *passenger revenue accounting;* Book and Record Clubs: *billing and accounts receivable;* Communications: *cash application, toll ticket readings;* Finance: *installment loan accounting;* Insurance: *premium payment, paid claims;* Motor Freight: *revenue accounting;* Public Utility: *customer accounting, meter reading transcription;* Publishing: *subscription renewal and payment;* Railroad: *freight bill control;* Retail: *billing and accounts receivable;* and State and Local Government: *compensation payments, registration and licensing, tax accounting.*

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down
when data cards
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Circle No. 14 on Reader Service Card.

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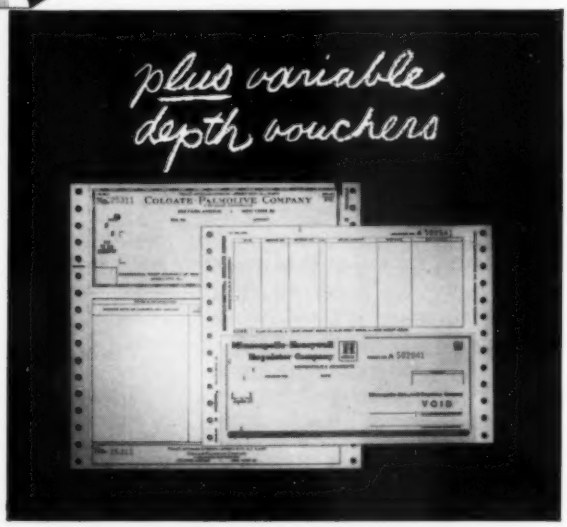

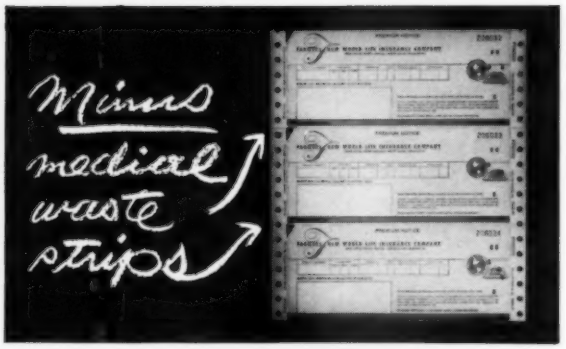


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Circle No. 23 on Reader Service Card.

# PRODUCTS & SERVICES

### STEP FOR SMALL BUSINESS

A new computer concept for bringing electronic data processing to small business has been announced by Remington Rand. The system is called Univac STEP for "Simple Transition to Electronic Processing." This new solid state computer system has been developed for customers now using punched card equipment who have growing needs for electronic data processing.

This is a flexible system, with a Univac solid-state computer as a nucleus. The basic system consists of four units which can be easily expanded to greater capacity when business growth demands it.

The system is comprised of a central processor with a 26,000 digit capacity, a high-speed reader handling 450 punched cards a minute, a punch unit handling 150 cards a minute, and a high speed printer.

Expansion can be accomplished by adding up to four additional memory units, each of which will carry 6,000 more digits, making ultimate capacity of 50,000 digits possible. The basic central processor's arithmetic speed can be stepped up by the addition of multiply/divide unit.

Univac STEP will rent for $3500 a month, with a nine month delivery schedule. The basic system is compatible with Univac equipment now in use and can be readily applied to payroll problems, billing and inventory control, sales analysis, statistical reports and savings and mortgage loan accounting. When expanded, STEP can include complex production control, planning and scheduling, wholesale billing and similar work.

**Circle no. 40 on reader service card.**

### NEW INSERTER

A new Phillipsburg Inserter designed to automatically insert and mail random, multiple punched cards was demonstrated for the first time by the Bell & Howell Company, Chicago, at the National Business Show in the New York Coliseum, October 24 to 28.

The new Phillipsburg Inserter automates the stuffing and mailing of punched cards, extending into the mailroom the speed and accuracy of the electronic data processing equipment and punched card machines used in modern punched card billing and continuous inventory systems.

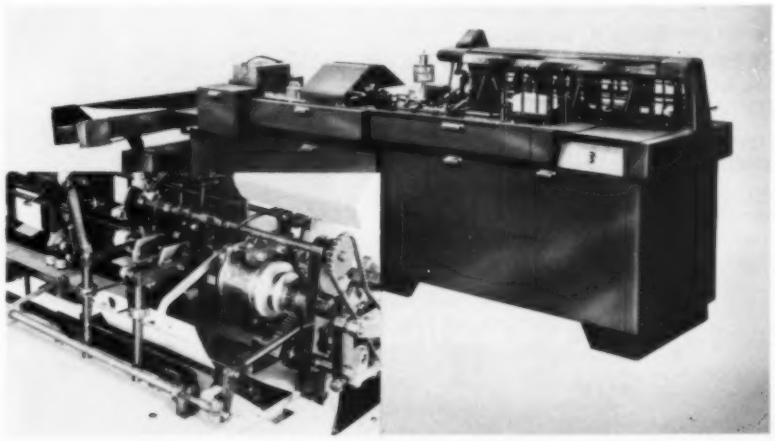
The machine selects a statement card and a varying quantity of accompanying individual transaction cards from one station, feeds additional inserts from other stations, opens envelope flaps, inserts, closes, moistens and seals the envelopes, imprints postage and an advertising message, counts and stacks, all in one continuous sequence.

**Circle no. 41 on reader service card.**

### DATA COMMUNICATIONS SYSTEM

The Kinetape Data Communications system was on display at the International Systems Meeting of the Systems and Procedures Association in New York City, October 10-12. Kinetape system transmits magnetic tape data over telephone or telegraph lines at 300 characters per second, making it possible for computers and data processing systems to "talk" directly to each other. Kine-

*(continued on next page)*



tape system is a product of Collins Radio Company, Western Division, Burbank, California.

**Circle no. 42 on reader service card.**

## NOISE ABSORBER

Gates Acoustinet, Inc. has developed an acoustical enclosure to absorb the noise of key punches, verifiers, tape to card machines, etc. This new unit is effective acoustically because it actually absorbs the noise at the machine before it can escape into the office and disturb other office personnel. The company guarantees a 50 per cent reduction in sound. The unit includes lighting and a tiltable shield which allows complete access to all moving parts of the key punches and/or verifiers with a simple motion of the hand. The new table model ACOUSTINET, Model IDP-100, is put directly on the key punch without legs or fastening device. All units are shipped standup and there is no installation.

**Circle no. 43 on reader service card.**

## OPTICAL SCANNER

The Optical Scanning Punch, *designed to read handwritten markings on a standard 90-column punched card* and punch the appropriate code holes into the same card, does this work at the speed of 150 cards per minute, announces Remington Rand. It does not require the use of a special magnetic pencil—any soft lead pencil will do—and no special symbols are needed. It reads actual numerals as well as normal pencilled notations such as check marks, lines, X-marks and circles.

By eliminating the need for manual card punching from original source documents, the Optical Scanning Punch drastically reduces the most time-consuming phase of punched card data processing and automatically detects improperly marked cards.

The new machine provides a high degree of programming flexibility through the use of manual switches on the control panel and through the use of a removable plugboard. The operator can make rapid program changes by replacing one plugboard with another, just as in the operation of the Remington Rand Univac 60 and 120 punched card electronic computers.

**Circle no. 44 on reader service card.**

## PRINT-PUNCH

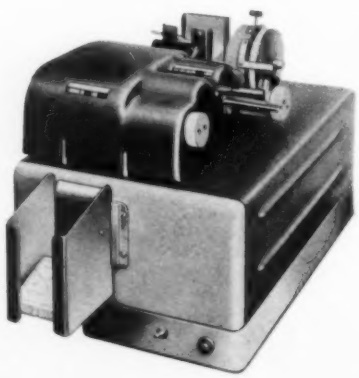
A new model Numbering Print-Punch machine, equipped with a serial numbering code — punching and imprinting attachment, has been announced by the Dennison Manufacturing Company, Framingham, Mass.

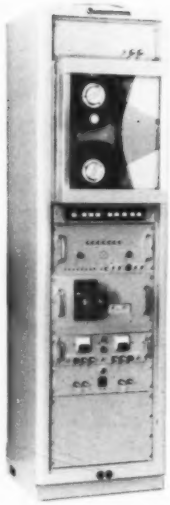
With this machine, it is possible to use serially numbered, multiple stub tag systems as basic input media in data processing systems governing production control, inventory control, piece rate payroll, shipping control and inspection control.

The Numbering Print-Punch machine produces either 20 or 26 digits of imprinted and code punched data, plus a five-digit imprinted and code punched serial number on each stub in a Print-Punch tag. The serial number may be either repetitively or consecutively numbered from 00,001 to 99,999. The machine may be set to repeat one number two to ten times before advancing to the next number.

Print-Punch stubs may be automatically converted to 80 column or 90 column punched cards with equipment now available.

**Circle no. 45 on reader service card.**





## PAPER TAPE/MAGNETIC TAPE

A data converter for translating standard 5-level teletype paper tape to magnetic tape in a format acceptable to the IBM 704 or IBM 705 computer is now available from the Electronic Engineering Company of California.

The ZA-752 can be used as an on-line unimode translator for the preparation of IBM 704 or 705 magnetic tapes using data transmitted from distant points via teletype. It contains a 128-character ferrite core memory. A manual and visual check of code conversion and memory is provided.

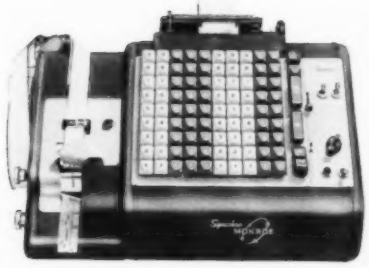
The ZA-752 data converter can be provided to produce magnetic tapes for entry into computers other than IBM.

**Circle no. 46 on reader service card.**

## ACCOUNTANTS' PROGRAM MACHINE

A source data originator designed exclusively for data processing in accountancy has been announced by Monroe Calculating Machine Company, Inc. The new product, available in both single-register and duplex models, is the Synchro-Monroe Accountants' Program Punch Tape Adding Machine. The P-03 succeeds two earlier punched tape adding machine models, combining the features of both and offering several new features.

Compatible with data processors of all service bureaus, the portable Accountants' Program machine universalizes source data origination in



processing for accountants. The machine features automatic repetition of all code information, eliminating the need of re-indexing repetitive reference numbers. Another new feature are keyboard symbols, providing clear-cut identification of operating controls. Five excess codes for the future give new versatility in systems improvement, and eliminate the chance of machine obsolescence.

In Accountants' Program data processing, accounting information is recorded on punched tape. Tapes are processed at data processing service bureaus, and printed accounting records and reports are returned to the accountant for his clients.

**Circle no. 47 on reader service card.**

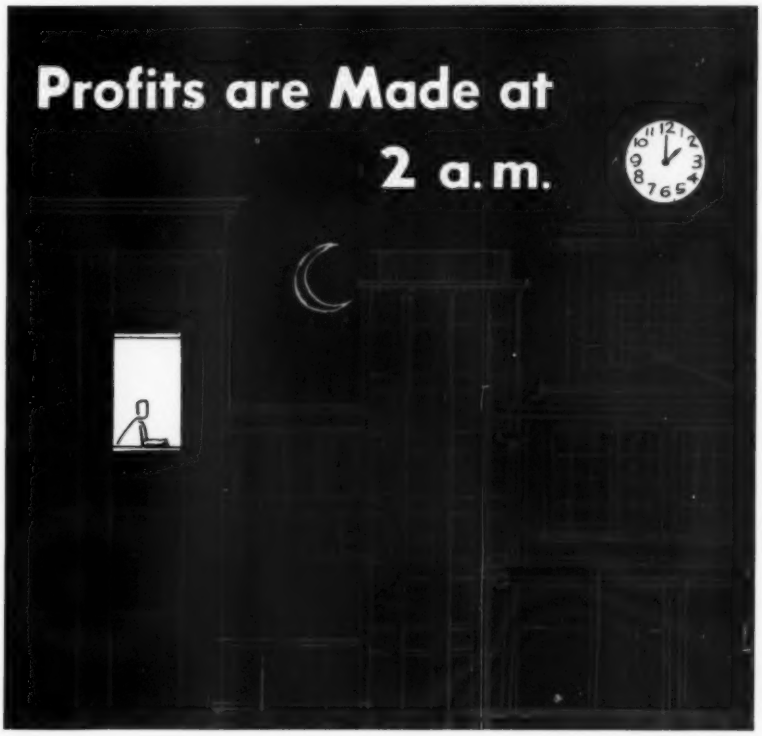
### DIGIT-MATIC DATA PUNCH

This latest digital device introduced by Victor Adding Machine Co. allows for remote control adding machine operation through the use of solenoids with both a printed detail tape and a punched data processing tape resulting. It can be activated from distant points and by a variety of associated equipment.

It is possible to activate the unit through digital converters, communications systems, control instruments, digital counters, digital testing equipment, flowmeters, production scales, pulse height analyzers, temperature recorders, time interval meters, typewriters and similar industrial, business and laboratory instruments.

Simultaneously from each such operation comes a printed record for immediate information, plus punched tape for further automatic handling. The punched tape contains coded information in 5, 6, 7, or 8 channels. Punched tape output can be used to plot curves, transmit data via long wires or to a central office, and accumulate inventory figures.

**Circle no. 48 on reader service card.**


The City sleeps, but this business goes on as usual, with the help of Baltimore Business Forms. Day and night customers phone their orders to central headquarters. Robot machines, in branch delivery offices, print orders simultaneously on troublefree Therm-O-Seal Handy-Fast Forms, recommended by the Baltimore Business Forms Systems Advisor. When morning comes . . . nighttime orders are completely written . . . ready for delivery without delay. The profits have been made . . . while the city sleeps.

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De Paris on EQUIPMENT – A Regular Feature

# Systems at Lower Costs

JOSEPH R. DE PARIS

MEDIUM-SIZED and small punched card users often have been hard-put to justify an excursion into electronic data processing.

The costs of a computer installation, notwithstanding the benefits inherent in electronic processing, have been too steep for a large segment of this class of potential users. Those of this class who have succeeded in making the transition from electro-mechanical to electronic equipment have had to be content with a half-loaf, the card-oriented computer. The rest of the loaf, the magnetic tape system, was simply "too rich for their blood."

The advent of computers such as the RCA 301 and the IBM 1401 changed this situation significantly. Aimed directly at the medium-small installation, these systems are priced in ranges which are the "open sesame!" to the electronic age for the majority of those previously unable or unwilling to take the plunge. Now it is possible to get a card or tape system, tailored to your requirements, for literally thousands of dollars less per year than before.

If you haven't done it yet, or if it has been some time since you've done a feasibility study, call in the various manufacturers. You will be surprised—pleasantly—by the new look in data processing.

### New developments for IBM 1401

Following up the introduction of IBM's 1401, there have been a series of announcements of additional components and devices which add importantly to the power and flexibility of the system. One can see the same pattern emerging as was evident after the 305 Ramac was announced. If you recall, the 305 started life as a rather simple, compact unit. Today it is available with bells and whistles which have enhanced its usefulness tenfold. So with the 1401, new developments are announced with a rapidity reminiscent of the explosions of Chinese firecrackers.

One of the latest—especially significant to those considering tape systems—is the announcement of a new tape unit, the 7330. The 7330 is a new, smaller, more compact unit than the 729 II or 729 IV. It has a unique horizontal vacuum column in place of the customary vertical columns. Tape processed by the 7330 is completely compatible. The same two IBM densities of 200 or 556 characters per inch are possible.

The real differences between the 7330 and 729 II or IV drives lay in speed and price. The 7330, for example, passes tape at the rate of 20,000 characters per second at the 556 char./inch density; the 729 II operates at 41,667, and the 729 IV at 62,500 characters per inch. Roughly, the 729 II is twice as fast and the IV is three times as fast as the 7330. Another way to say it is this: the 729 II moves tape past its read-write heads at 75 inches per second, the 729 IV at 112 inches per second, and the 7330 at 36 inches per second.

### Costs

Now for the price. The 7330 units rent for $450 per month compared with $700 and $900 for the 729 II and IV respectively. In addition to this lower rental a new lower cost configuration is being offered. This configuration consists of a 4000 character memory in a modified 1401 processing unit, the 1402 read/punch, the 1403 printer, and four 7330 tape drives at a base rental of $5155 per month. The 1401 in the 7330 configuration is some $600 less than the 1401 supplied with 729 tape drives. Normally standard features renting at about $120 per month are optional in this configuration. What accounts for the rest of the $600? Apparently just an old-fashioned price reduction.

It seems the 1401 has a configuration designed for the needs and the pocketbook of almost every small to medium-sized prospect.

### IBM 1410 system

Between the 1401 and the 7070, there has been a gap in IBM's line of solid-state, transistorized computers. But this is true no longer. The filler is a new data processing system, the 1410 which now takes its place in the line. This system comes in three basic models—10,000, 20,000, and 40,000 character memories. The 1410 has a 4.5 microsecond storage cycle which is about twice as fast as the 1401's 11.5 microsecond cycle.

The 1410, a buffered system, has a Table Search command, and 15 index registers. It has two data channels *(one standard)*, each of which can accommodate 10 tape drives. The tape drives can be 729 II, 729 IV, or 7330. The 1402 read/punch and 1403 printer are part of the 1410 system.

An average card system rents for about $7500; an average tape system about $12,000 per month.

And so the data processing derby keeps zooming along. Day after day, month after month, something new is added. Prospect for the future? More and more exciting announcements. Big as the developments have been to date, they will seem insignificant alongside what is to come. Hang on! We'll take the ride together.■


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# PEOPLE AND PLACES

### IBM RESEARCH

DR. GILBERT W. KING is now associate director of research for systems and engineering at IBM. He is responsible for the research programs in experimental machines and systems, in addition to the programs in the engineering sciences.

### AT REMINGTON RAND

Remington Rand made a number of changes. The new prexy is DAUSE L. BIBBY, who joined the company as executive vice president in March, 1959. Previously he had been executive vice president at Daystrom, Inc., and before that at IBM.

ROBERT D. BROWN, vice president and general manager of the systems division, has the same capacity in the office machines division.

FRANCIS V. BERGREN has been promoted to vice president and general manager for the systems division.

HOWARD V. WIDDOES is now vice president handling special assignments and industry relations for the group headquarters staff.

### AMA NEWS

CHARLES F. SCHWEP, former president of Trident Films Inc., New York, has been appointed manager of the Visual Communications and Training Department, a new unit of the American Management Association.

### GENERAL PRECISION

A new division with responsibility for all major systems has been formed at GPL Division—General Precision, Inc., under the directorship of WILLIAM H. HEATH. Among his major tasks is the air traffic control modernization program for the Federal Aviation Agency.

### BURROUGHS PERSONNEL

HARRY G. BOWLES, controller, has been named vice president and controller at Burroughs. He will be chairman of the new integrated financial planning committee serving all segments of the corporation.

KENNETH C. TIFFANY has resigned as vice president—finance to join Massey-Ferguson, Ltd., of Canada.

WALTER HANSTEIN, JR. is now associate director of engineering at Burroughs.

PAUL S. MIRABITO has been promoted to vice president in charge of the company's defense contracts. Previously he had been general manager in this area.

### PHILCO G & I

WILLIAM J. SCHOENBERGER has been appointed northeast manager for Philco Corporation's Government and Industrial Group. He is a senior member of the Institute of Radio Engineers and an associate fellow of the American Astronautical Society.

### AT ITEK

ROBERT F. BROWN has been elected a director of Itek Corporation. Mr. Brown is a partner of Kuhn, Loeb & Co., New York.

### CONTROL DATA APPOINTMENTS

JOSEPH A. RESCA has been appointed as sales manager of the eastern region (20 eastern states) at Control Data's Computer Division.

ROBERT E. WESSLUND has been chosen as a member of the engineering staff to supervise the development of micro-electronic techniques used in the miniaturization of solid-state computers.

### BENDIX SYSTEMS

The appointment of DONALD G. SPEYER as director of contracts of the Bendix Systems division (Ann Arbor) has been announced. Speyer will be responsible for all contracts and subcontracts held by the division.

### NEW CONSULTANTS

Booz, Allen & Hamilton have taken on seven new consultants: LOUIS E. ALBRIGHT, ROBERT J. GILLMORE, CHARLES L. MACK and DALE L. REISTAD in the New York office; CARLTON L. DUDLEY, JR. and WALTER W. FASTER in the Chicago office; and JOHN H. YIENGER at Los Angeles.

### RCA APPOINTS

HAROLD M. EMLEIN is now operations manager of a new plant now being built for EDP division, Radio Corporation of America.

C. WESLEY MICHAELS is now manager, planning and market research for the same division. He was formerly associated with the GE Company at Bridgeport, Conn. and Syracuse, N. Y.

### AMPEX MANAGER

DENNIS D. WILLARD has been named manager of the Advanced Computer Laboratory for Ampex Data Products Company. He was formerly with IBM. ■

# OUTPUTS

## ITEMS OF INTEREST FROM HERE AND THERE

### DATA PROCESSING SYSTEMS ENGINEERING

A computer system for one of the world's largest accounting tasks—that of the Internal Revenue Service—was described at the opening in New York City of a new type of school to teach the science of data processing systems design and operation.

The school is International Business Machines Corporation's Systems Research Institute. Located on United Nations Plaza, it is the first industry-sponsored graduate school to educate people for advanced professional work in data processing systems engineering. Data processing systems engineers are broad-gauged computer experts whose job it is to help business, industry, science and government make the best use of changing data processing equipment and techniques.

Thirty-five top IBM computer systems specialists from the U. S., Great Britain, Germany and Canada reported for the opening of classes. They are the vanguard of the more than a thousand students the Institute expects to graduate during the next five years.

### INTERNATIONAL RECIPROCITY

A licensing agreement between AB Atvidabergs Industrier, Stockholm, Sweden, and North American Aviation, Inc. involving the products of Facit Electronics (subsidiary of the Stockholm firm) and the Autonetics Division of North American Aviation, has been announced. The agreement provides for the manufacture and distribution of the Facit electronic computer accessory equipment by Autonetics in the United States, Canada, and Mexico. The Swedish firm will have similar rights regarding Autonetics Recomp computer and the Nifte automatic factory testing equipment in Sweden, Norway, Denmark, and Finland. Autonetics Industrial Products will produce and sell Facit's high speed paper tape punch and reader equipment, and a fast direct access magnetic tape unit. The transistorized equipment will be compatible with the solid state Recomp digital computer as well as other digital computers.

### STEP

Marketing Management Associates, Inc., marketing and data processing firm located in Ridgefield, Conn., has announced that it has contracted with Remington Rand Univac for the installation of a STEP solid state computer system.

The Univac STEP represents a newly marketed, expandable solid state computer system.

### RETAIL MERCHANTS BUREAU

Mountain Data Systems, Inc., Bedford Hills, N. Y., is providing management with timely and comprehensive weekly and monthly sales breakdown reports. These are prepared for each of the departments at their retail outlets. The centralized data processing system station uses a Bendix G 15 computer. The retailers have installed special commercially available sales registers at their stores which produce punched paper tape output. The daily tape of each register is air mailed to the center for processing.

### MICROFILM SYSTEMS EDUCATION

The Eastman Kodak Company has established an educational microfilm systems department at the Recordak Corporation, a subsidiary. This new department plans to offer technical assistance in systems and microfilm techniques to individuals and organizations engaged in the assembly and use of educational material in programmed format and to study the design features of microfilm equipment that may be required.

### COMPUTER SHOWCASE

IBM has opened a new Solid State Showcase of advanced computer equipment in its Product Display Center at Madison Avenue and 57th Street, New York City. Displayed are the IBM 1401 and 1620 systems, 609 calculator, 108 card proving machine, and 84 sorter. Also on display are teleprocessing products: the 1001 data transmission system and data transceiver with new dial-up feature. Facilities of the Center will be used for application demonstrations and testing computer programs. Tours for the public are conducted Monday through Friday at 10:00 a.m. and 3:00 p.m.

### U-T COMPUTING CENTER

The University of Tennessee will establish a Computing Center on the Knoxville campus for University-wide use in solving complex scientific research problems. It will be available to all University departments for research and for teaching on the graduate level.

Its facilities will be able to handle the complex problems found in chemistry, mathematics, physics and engineering research, and the less complex *mass-data* projects of business research. The Computing Center will centralize computing work at the University, and will supplement, but not replace, punched card and computing equipment already in use in certain engineering and business departments.

### G-15 USERS

Membership in the G-15 Users' Exchange Organization grew by 50 per cent in the last year, it was reported at the fifth annual conference held in August at Pittsburgh. One hundred fifty new programs were submitted to the library since the last meeting and more than 500 programs were distributed to members during the same period.

### BOWLING BOOST

A special bowling score program has been developed by a civil engineering firm to use with Bendix G-15 general purpose computers. The program accepts the results of three bowling games and computes the total pins and games for each player of ten, ten-man teams (including substitutes and blinds).

### IBM LAB

IBM has announced expansion of their development laboratory in San Jose, California.

### STANDARDIZATION PROGRAMS

Office Equipment Manufacturers Institute is sponsoring two major international standardization pro-

grams, to cover data processing machines (including electronic computers) and office machines. The two standardization projects are based upon proposals submitted before a recent American Standards Association by OEMI. The United States has also been granted the secretariat for the international data processing standards program, which means that the OEMI committee will be the technical committee for the International Organization for Standards. The efforts of the data processing program will result in logical systems standards, including a common language, which will enable users to interchange information and programs among computers.

### INSURANCE STATISTICS

Nationwide Insurance is to install a National 304 solid state system for analysis of statistics from the company's 15 regional offices throughout the country. This will be data from the more than two million policyholders of the company.

### INSURANCE RATE BOOK

Minnesota Mutual Life Insurance Company of St. Paul will prepare a rate book covering 40 insurance plans and six riders on a Burroughs 205 magnetic tape system.

### CHICAGO SERVICE BUREAU

RCA is opening Chicago's first fully transistorized data processing center at 110 North Wacker Drive in the Morton Salt Building. This will be the fourth in a network of service bureaus being created by RCA to solve the paperwork problems of companies of all sizes across the country. Other centers already in operation are in New York's financial district, in Washington, D. C., and at Cherry Hill, N. J., in the Philadelphia-Camden area.

Later the centers may be linked by a new system, DaSpan (for data spanning), so that companies in offices in various cities can channel their data processing back and forth quickly and easily.

### UNIVAC FOR NAVY

Remington Rand has developed the Univac Advanced Navy Computer for the new Naval Tactical Data System. The extremely compact electronic computing system collects, processes and evaluates naval tactical data and recommends courses of action in virtually "zero" time.

### INFORMATION RETRIEVAL

Retrieval of legal information was demonstrated to the American Bar Association in Washington by IBM. Placing all statutes of Pennsylvania relating to public health and laws from the Hospital Law Manual in the magnetic tape memory of a 650 computer, the computer came up with statutes related to any query fed via the card reader. This was done by key words searched through the vocabulary list created while the laws were recorded. Another demonstration featured patent law using a Ramac 305; the Ramac searched for and printed out laws in the field of patent design upon query.

### COMPUTER FOR SCIENCE

The U. S. Atomic Energy Commission's Knolls Atomic Power Laboratory at Schenectady, N. Y. has accepted delivery of a Philco 2000 electronic data processing system. KAPL is operated for the AEC by the General Electric Company. The 2000 will be used by scientists in nuclear reactor design research.

### TRANSISTORS

Greater yields resulting from increased automated precision production has made possible price reductions of 14 of Philco's MAT (micro alloy) and MADT (micro alloy diffused-base) transistors.

### COBOL USER

RCA announced that their RCA 501 now is ready to use the COBOL Narrator, thus becomming the first of the manufacturers to announce for COBOL (Common Business Oriented Language) which was created by a committee of manufacturers at the request of the Department of Defense. ■

## Notable Quotes

"The day has long passed when management can concentrate solely on profitability in a local competitive market, where labor is a commodity. Variables grow with applied technology; with the political and economic changes forced by technology. Fortunately, electronic computers are sorting out some of the implications of the variables at lower levels, but the final decision rests, and must always rest, with the man at the top. He must of necessity be a generalist." Stuart Chase in *"Are You a Specialist or a Generalist?" Think*, August, 1960.

"So the term 'common language' requires some explanation of the meanings it has acquired. It can be used in three ways:

"1. A dictionary, or glossary, of technical terminology to be used by a body of people, possibly internationally.

"2. A standard coded format on a medium for transferring information which can be interpreted for different purposes by a number of machines. Punched cards and punched paper tape are common examples of media employed to transfer information in a variety of common languages from one machine to another.

"3. A system of coding for information, whereby the information is automatically translated into the correct internal code of any available computer. It also implies that any computer code can be translated into the coding of the common system." J. W. Mitchell, "What is Automatic Coding?" *Automatic Data Processing*, June, 1960.

"For the very large company, anything up to the biggest computer and its accessories may be the cheapest way to do the job. A smaller company may find that it may be able to fit its needs and pocketbook with only semi-automatic data processors operated with human assistance.

"Several factors will be working in the next few years toward lowering the cost of complex items of office equipment. While I cannot predict that electronic or highly mechanized hardware will become, by ordinary definition, inexpensive, I do believe that substantially more automatic equipment will be available for smaller business." Milton E. Mengel, *Office Executive*, August, 1960. ■

# DATA . . . yours for the asking

VISUAL PLANT LAYOUTS has available a new catalog listing 148 items including all models of punched card equipment as well as desks, chairs, file cabinets, business and calculating machines, grid boards, wall sections, columns and scale figures of office personnel—all in miniature for arranging and rearranging departments. This miniature duplication of an office can save time and constant moving and give more effective layouts.

**Circle no. 70 on reader service card.**

THE AMERICAN INDUSTRIAL WRITING INSTITUTE has been established to improve the quality of business and technical communications. The new group has resulted from the merger of the Technical Writing Improvement Society WEIS and the Western Technical Writing Institute.

The organization was formed to meet the need for a central clearing house and information center on industrial communications improvement. Studies have shown that communications are a major part of industrial and scientific overhead and yet communications have not kept up with the advances in other fields. Papers are still written and presented as they were in the 1890's.

Individual memberships in the new institute will be by invitation. Company subscribing memberships are available. Temporary quarters are in Pasadena, California.

**Circle no. 71 on reader service card.**

NEW IBM LITERATURE includes: UNIT RECORD EQUIPMENT—*IBM 609 Calculator Model B-1 Bulletin; How to Punch Holes in Your Rising Tide of Paper Work; Balanced Data Processing* (7070-1401).

**Circle no. 72 on reader service card.**

CUSTOMER SERVICES — *Balanced Service for Balanced Systems.*

**Circle no. 73 on reader service card.**

EDUCATIONAL AND INSTITUTIONAL—*IBM 609 Calculator for Aging Accounts Receivable.*

**Circle no. 74 on reader service card.**

FIRE AND CASUALTY—*Series 50 Data Processing Machines for Fire and Casualty Insurance Agencies.*

**Circle no. 75 on reader service card.**

MANUFACTURING — *IBM 609 Calculator for Fixed Assets Depreciation;* and *Line Material Industrial Traffic Statistics.*

**Circle no. 76 on reader service card.**

FOUR RUSSIAN TECHNICAL JOURNALS translated into English will be continued during the coming year by the Instrument Society of America, under a grant from the National Science Foundation. The four magazines are: *Automation and Remote Control, Measurement Techniques, Instruments and Experimental Techniques,* and *Industrial Laboratory.* Information on subscriptions will be furnished.

**Circle no. 77 on reader service card.**

ABLE-STIK DISPENSERS are offered as a bonus with label orders. The offer is described in detail in a two color folder of the Allen Hollander Company which also describes the two-way dispenser that accommodates both roll type and fanfold packs of labels.

**Circle no. 78 on reader service card.**

MAGNETIC MEMORIES, Series 3100, versatile coincident current, random access storage units for data processing application, with capacities ranging from 128 to 4096 words and from 4 to 64 bits per word, are described in a four page illustrated technical bulletin. The bulletin contains a full description, block diagram and timing chart, step-by-step operating procedure, and points out the low-cost reliability, 10 microsecond address to address cycle times, random or sequential, and binary or BCD operating modes. The versatility of these transistor-operated data storage units is illustrated with four applications.

**Circle no. 79 on reader service card.**

ELECTRONIC ENGINEERING COMPANY of California has a new short form catalog available which lists magnetic tape search and control systems, time code generators, data handling equipment, and other electronic products.

**Circle no. 80 on reader service card.**

COLOR EDGE CARDS PAMPHLET put out by Friden, Inc., may be used as a handy reference for ordering cards and tapes for systems applications, for quick identification by different colors. Both cards and tapes are offered in a variety of colors so that sales invoices, reports, checks and vouchers, accounts payable, purchase orders, and letters are easily identifiable by individual color.

**Circle no. 81 on reader service card.**

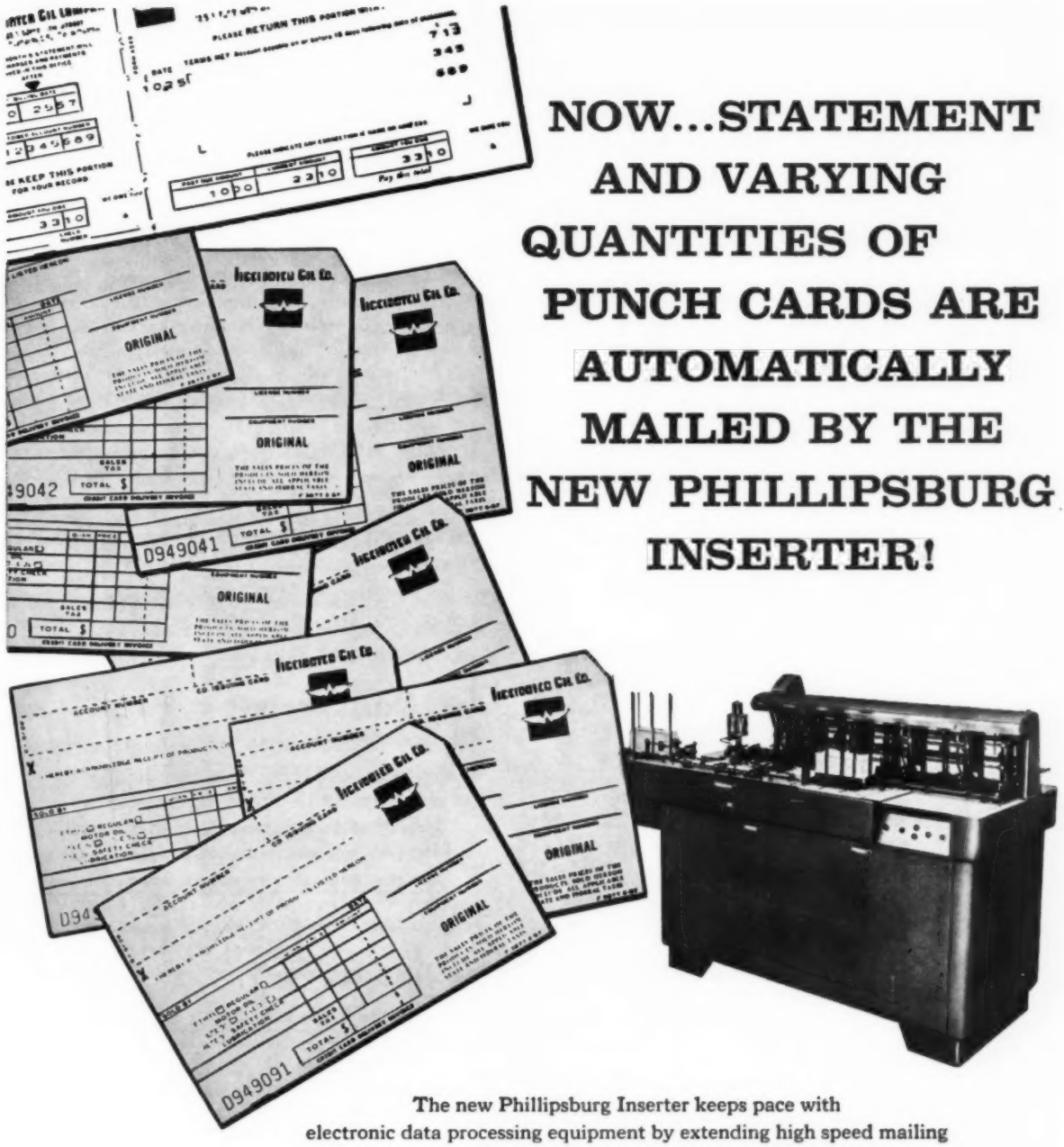
TO AID MANUFACTURERS OF COMPUTERS, users of computers and manufacturers of pedestal floors in the selection and maintenance of resilient surfacing, is the purpose of a booklet just published by the Armstrong Cork Company. The raised panel floor has proved valuable in electronic computer installations where heavy equipment and its complicated wiring can be easily and economically relocated. This requires surfacing material with good resistance to indentation under heavy equipment, dimensional stability and uniformity, dialectric strength and electrical volume resistance, and ability to maintain good looks under heavy traffic—all qualities inherent in vinyl floor tile. The booklet is also a guide to maintenance of such raised floor surfaces.

**Circle no. 82 on reader service card.**

"BRIGHT IDEAS TO MAKE BRIGHT Girls Shine at Filing" is a booklet aimed at increasing filing efficiency and reducing errors which has been published by the Avery Label Co.

The 16 page booklet offers useful tips on filing procedures, how to minimize errors and maintain orderly filing cabinets with the least amount of work. Fifteen simple rules are listed to standardize filing, so that folders can easily be located in filing cabinets.

**Circle no. 83 on reader service card.** ■

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Complete information on the new Phillipsburg Inserter for punch card billing and setting up punch cards for automated mailing are detailed in a brochure available from Bell & Howell Company, 14 East Jackson Boulevard, Chicago, Ill.

Circle No. 16 on Reader Service Card.

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FOR THE BEST PRICE contact us on Used Data Processing Equipment. We buy & sell IBM control panels & wires, IBM & Remington Tabulating Equipment, Card Housing Equipment (All types and makes). Consult us on your systems conversions. Universal Business Equipment Co., 533 S. Dearborn St., Chicago 5, Illinois, HArrison 7-4878.

**WANTED:**
**SHORT PROGRAMMING TIPS**

Have you a favorite programming trick, gimmick, or shortcut that you want to share with our readers? Write it up in 300 English words (or less) and submit it. We will pay $10.00 for each one used.

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# BOOK SHELF

**SUPPLEMENT TO CUTTING THE COST OF YOUR EDP INSTALLATION,** Canning, Sisson and Associates, Inc., 1140 South Roberston Blvd., Los Angeles 35, Calif., 1960, 25 pages. The Supplement is free to all purchasers of the Report, otherwise it is $10.

The Supplement goes into the findings of the Pentagon fire and tells of the recommendations made by the Factory Insurance Association for protection of computer installations, tapes, and punched cards. There are recommendations for the design of a computing facility which would prevent the errors at the Pentagon. The Supplement covers six areas: *Lessons Learned from the Pentagon Fire, Equipment Fire Protection and Tape Combustion Factors, Installation Requirements of Transistor Machines, Seven Studies of Organizations with Transistor Machine Installations, Comparisons of Installations in Organizations Surveyed, and Basic Air Conditioning Requirements for Installed Transistor Machines.*

## Seen in Print

**COMMUNICATIONS: THE VITAL LINK,** Electronic Age, Spring issue, 1960.

Electronic systems, such as RCA's DaSpan, bridge the final gap between computers and controls and make automation possible.

**WHAT A UTILITY HAS LEARNED WITH EDP** by R. N. Dreiman, The Controller, August, 1960.

First hand advice from the assistant comptroller of Pacific Gas and Electric Company on preparing the company, designing new systems, and fitting the computer into the corporate structure.

## INDEX TO ADVERTISERS

| | |
|---|---|
| Acme Visible Records, Inc. | 37 |
| Baltimore Business Forms Company | 41 |
| Beemak Plastics | 15 |
| Bell & Howell Phillipsburg Company | 47 |
| Business Electronics Inc. | 48 |
| Codo Manufacturing Corporation | 32 |
| Cummins-Chicago Corporation | 35 |
| Diebold, Inc. | 33 |
| Forms, Inc. | 38 |
| General Electric Company | 8 and 9 |
| Graphic Controls Corporation | 6 |
| Allen Hollander Company, Inc. | 49 |
| International Business Machines Corporation, Data Processing Division | 26 and 27 |
| International Business Machines Corporation, Supplies Division | 5 |
| Kee Lox Manufacturing Company | 16 |
| Mac Panel Company | Inside Back Cover |
| Moore Business Forms, Inc. | 10 |
| Panels Wires Incorporated | 21 |
| Scriptomatic, Inc. | Inside Front Cover |
| Tab Products Co. | 7 |
| Wilson Jones Company | Back Cover |

Now in one split-wired printing on your data processing equipment you can imprint 2 and 3 identical sets of labels to address follow-up mailings, identify different sets of forms and documents for inventory and warehouse controls — ledger accounts — addressing of incoming and outgoing accounts.

This AUTOMATION/LABELATION DOUBLE and TRIPLE "split-wired" innovation by **allen hollander** permits data processing equipment to print the same information simultaneously, side by side, cutting machine time 50% with DOUBLE and 66⅔% with TRIPLE labels.

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### Check these time-saving and economy-production features of **able-stik** Pin Feed Labels:

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- ***Store 75% more labels in former shelf space***

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# editorial

THE TECHNOLOGICAL AGE is emphasizing more and more that we cannot separate the human being on the job from the human being at home.

"Try as he will," says Dr. Himler, a psychologist at the University of Michigan, "the individual himself cannot prevent his relationship on the job from influencing his home or vice versa. It would be most helpful if every employee could check his personal problems in the cloak room and then devote himself fully to his job during the remainder of the day. We know that doesn't happen. If it did we could probably dispense with many of our managers. In reality, whether they realize it or not, much of the time of managers is spent in getting people to work together efficiently in spite of personal problems, attitudes and motives which they bring with them."

The trend to conversion to data processing systems in many companies is compounding the problem. These devices, as discussed in our editorial last month, are creating a whole new series of personnel problems for management as well as for the displaced, disrupted and disorganized human beings directly involved. When these problems are recognized and put in their proper perspective solutions can be developed.

In spite of the great strides made in automating the office, human beings still comprise our most vulnerable factor. Men are promoted in business for their skill and technical knowledge, often being put in a position to manage other people without having the techniques of handling people. Many times executives are too busy with their engineering problems to bother with human psychology, yet an executive must be an engineer of human beings as well as of inanimate electronic systems. He cannot substitute laws of physics for laws of human nature. Neither job analysis nor engineering textbooks cover the human side. The science of man analysis is necessary.

A business executive spends around 60 or 70 percent of his time in direct consultation with other people. Many of these contacts are private interviews, or as Dr. Himler prefers as a more expressive term, in *interpersonal contacts*. The word *interview* has been used so often in connection with employment techniques that other uses are overlooked, the counselling, salary increase, warning, referral of an employee elsewhere, discharge, job evaluation, exit, and other types of interviews. In fact, new uses of interviews are in development all the time.

Employee opinion interviews, for example, are necessary to supplement questionnaires. For questionnaires alone do not reveal the true picture of employee opinions. Although interviews sometimes fall short of getting all significant factors, they are still the best instrument for getting close to a human being to find out his thoughts, wishes, feelings and motivations, and to find out how to influence him constructively for your benefit as well as his own.

Another use of the interview technique is the employee appraisal study. The term *merit rating* is being discarded, since it carries the unpleasant connotation of passing sentence on employees. But in the interest of productivity we need to make periodic appraisals of employees. The idea of passing judgment on someone is eliminated if we think of the appraisal interview as an instrument that attempts to evaluate his services and then help him to help himself. In effect, this is the goal of all counselling interviews. The appraisal interview offers a most effective channel through which the employee can be taught and motivated to organize himself in relation to his job so that everyone, including himself, will profit.

Further details regarding this vital subject of how human beings must deal with each other in a new world of data processing machines will be covered in our December editorial.■

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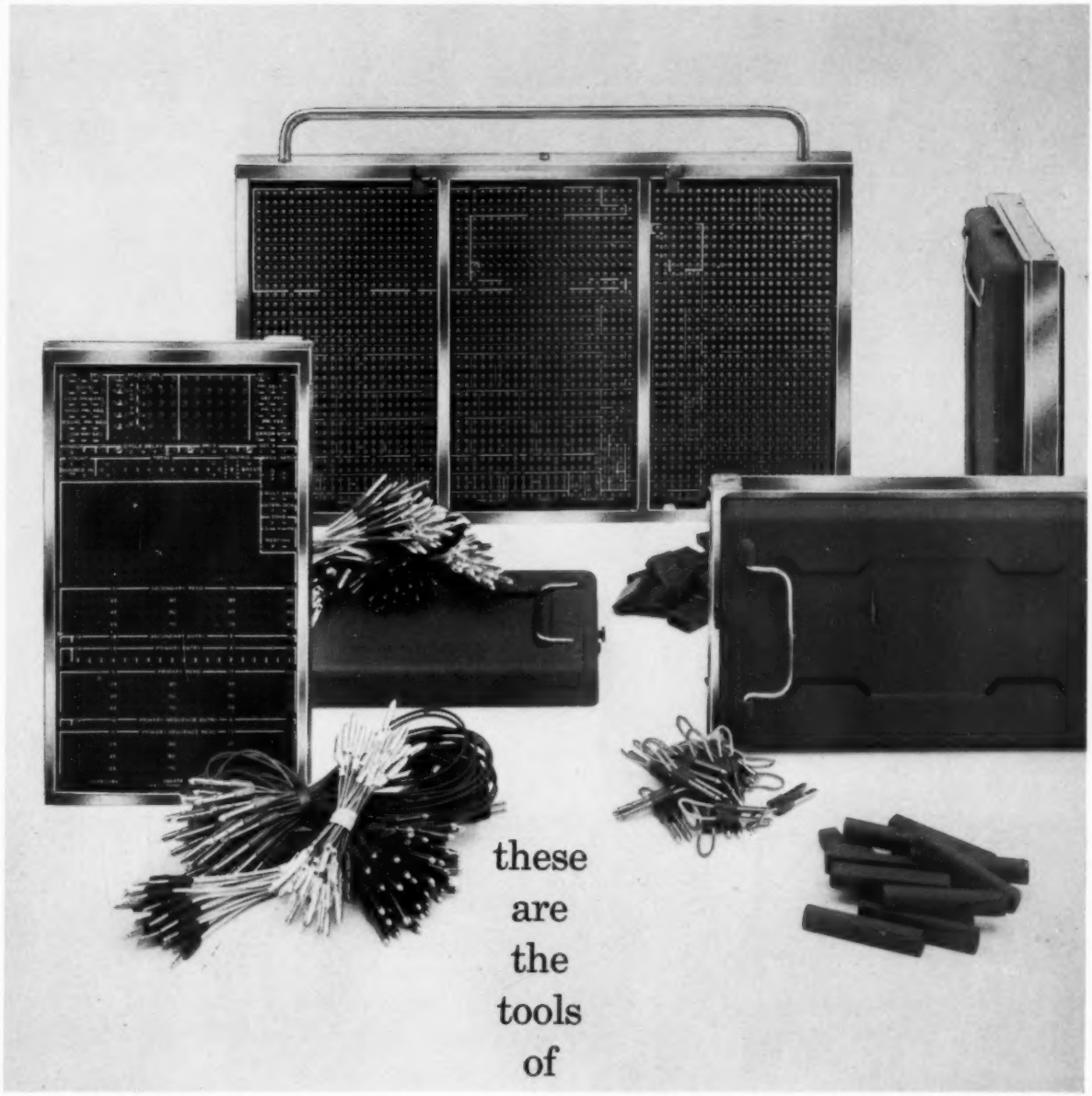


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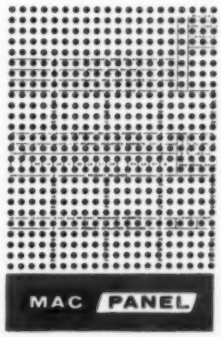


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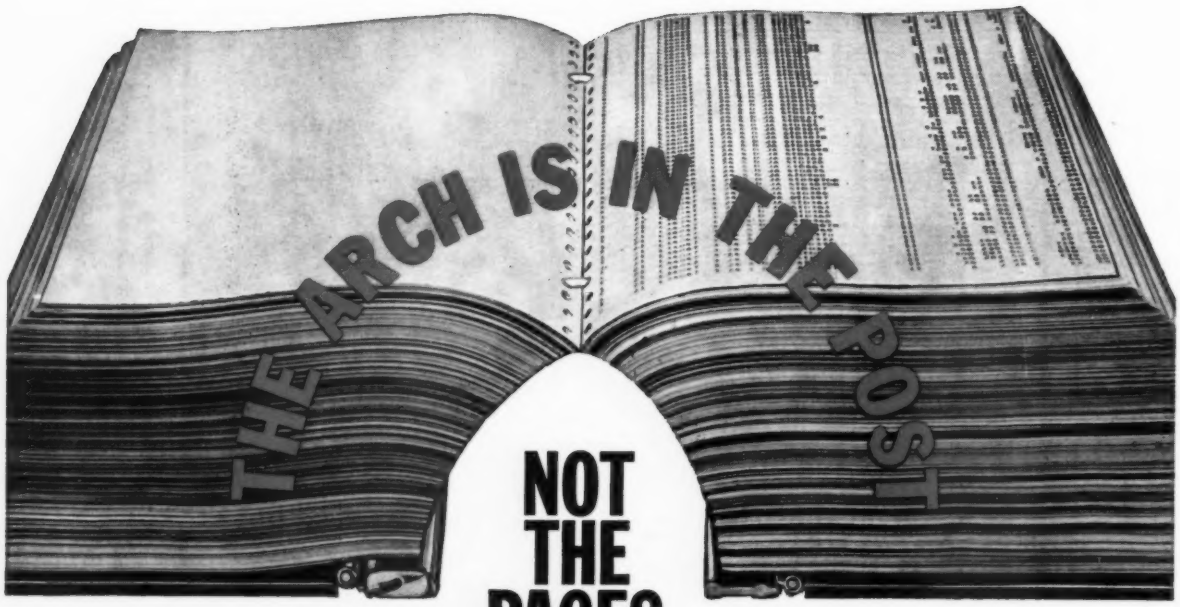


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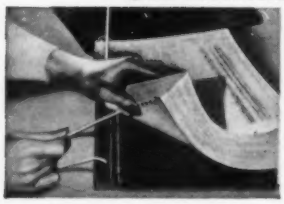

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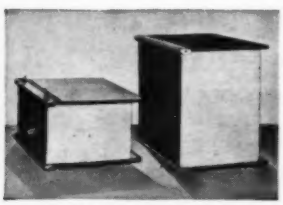

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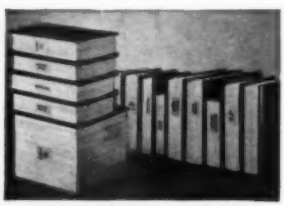

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